International Journal of Research in Medical Sciences
Rashmi et al. Int J Res Med Sci. 2016 Jun;4(6):2177-2180
www.msjonline.org
pISSN 2320-6071 | eISSN 2320-6012

DOI: http://dx.doi.org/10.18203/2320-6012.ijrms20161781

Research Article

Effectiveness of metoclopramide in preventing the incidence of post-operative nausea and vomiting in lower-segment caesarean section

Rashmi[1]*, Shivanand PT[1], Manjunath ML[2]

[1]Department of Anaesthesiology, Shivamogga Institute of Medical Sciences, Shivamogga, Karnataka, India
[2]Department of Physiology, Shivamogga Institute of Medical Sciences, Shivamogga, Karnataka, India

Received: 04 April 2016
Accepted: 09 May 2016

***Correspondence:**
Dr. Rashmi,
E-mail: rashmip@yahoo.co.in

ABSTRACT

Background: The common and distressing symptoms which follow anaesthesia and surgery are pain, nausea and vomiting. Nausea and vomiting are the most common side effects in the post- anaesthesia care unit. But post-operative nausea and vomiting have received less attention, though there are extensive literature, data are frequently difficult to interpret and compare. Therefore, the present study was undertaken to investigate the efficacy and safety of IV Metoclopramide as prophylaxis for postoperative nausea and vomiting in lower-segment caesarean section (LSCS) under spinal anaesthesia.
Methods: After institutional approval and informed consent fifty ASA I and II patients undergoing non-emergent LSCS taken for study. The patients received IV Metoclopramide 10 mg. Anaesthetic management was standardized. The incidence of vomiting and retching as number of episodes was studied. Nausea was graded depending on the severity and data derived.
Results: The mean episodes of emesis, nausea and retching at different postoperative duration were recorded. 64% patients experienced emesis at 1 hour. The incidence of nausea was more (56%) at 1 hour. 52 % of patients experienced retching at 1 hour whereas, 64% at 2 hour of postoperative.
Conclusions: Injection of Metoclopramide (10 mg) decreased the incidence of PONV as the side effect with this drug was minimal.

Keywords: PONV, Antiemetic Drug, Metoclopramide, Emesis, Nausea, Retching

INTRODUCTION

Nausea is an unpleasant, but not painful sensation referred to the pharynx and upper abdomen, associated with a desire to vomit or the feeling that vomiting is imminent. This may be brief or prolonged, often occurring m waves and may precede vomiting or occurs in isolation. Vomiting usually alleviates the sensation of nausea.[1] Vomiting is the forceful expulsion of upper gastrointestinal contents via the mouth and is usually, but not always, preceded by retching where no expulsion takes place but which involves activation of the same muscle groups. It is one of the defensive reflexes centre around the gastrointestinal tract. The pre absorptive (upper gut) and post absorptive circulation) detectors trigger a series of events when some toxin or irritants are ingested. Nausea stops further ingestion and facilitates the development of a learned aversion so that the food is rejected before ingestion when encountered again. Gastric relaxation reduces gastric emptying of the contaminated food and intestinal retro-peristalsis returns any contaminated food to the stomach. Retching and vomiting purges the stomach. But clinically nausea and vomiting are regarded as undesirable, because of the consequences they produce.[2,3]

Nausea and vomiting have been associated for many years with the use of general anaesthetics for surgical

procedures. First extensive description was given by John Snow, published in 1848. Inspite of the advances like using less emetic anaesthetic agents, improved pre and post-operative technique and identification of patient predictive factors, nausea and vomiting still occur with unacceptable frequency in association with surgery and anaesthesia, and is described as the big little problem.[4]

There are many different modes of intervention to prevent PONV. Antiemetic drugs play an important role in therapy of PONV. Though many drugs have been tried as prophylaxis and treatment of PONV, no drug has been proved significantly effective and a search for better drug continues.[5] The study conducted about the astounding efficacy of 5HT3 receptor antagonists as an antiemetic in the management of vomiting induced by chemotherapy and radiotherapy was followed by new era in the treatment of PONV.[3] Metoclopramide is in use as antiemetic for many years. But, the effectiveness of this drug in reducing and preventing incidence of PONV in LSCS under subarachnoid block was not well documented so far. Therefore, the present study has been undertaken to find out the efficacy and safety of prophylactic use of intravenous Metoclopramide (10mg) in preventing or reducing the incidence of PONV, in women patients undergoing LSCS under subarachnoid block.

METHODS

The study was carried out after the approval from ethical committee, and an informed, written consent from all the parturiants. Fifty parturiants undergoing elective LSCS were selected. All participants belonged to ASA grade I or II and were aged above 18 years and were received Metoclopramide 10 mg (i.v). Parturiants with renal impairment, hepatic disease, neurological and endocrinal abnormalities were excluded. Parturiants with history of PONV in previous surgery and patients with history of motion sickness, with history of vomiting and/or Ryle's tube in situ in the last 24 hours were also excluded.

Pre-operative evaluation: Pre-operative visit was conducted on the day before surgery. Detailed history of parturiants complaints was noted. General and systemic examination of cardiovascular and respiratory system was done.

Pre-operative order: Patients were advised to remain nil orally after 10 P.M. the day before surgery.

Anaesthesia: When the patient was brought to the operation theatre, her pulse rate and BP were recorded. The patients were received Metoclopramide 10 mg (i.v) injection 3-5 minutes before subarachnoid block. Pulse, BP and any side effects of drug given was also noted. Sub arachnoid block was performed in a left lateral position using 23G spinal needle at L3-L4 or L2-L3 interspace. 0.5% bupivacaine 2-2.5 ml depending on patients, were given. Following injection, patient was immediately brought on supine position and time of onset of action, T6 level was noted using pinprick method. Desired operative position was given after 5 minutes. Intra operative pulse, BP monitored and maintained with fluids. Duration of surgery was noted.

The parturiants were observed for 24 hours post operatively. Nausea, retching and emesis were recorded at 1 hour, 2 hour, 6 hour and 24 hours respectively. The number of episodes of emesis and type were recorded. Repeated vomiting within 1-2 minute period was recorded as single emesis. The data were recorded as follows. No emesis - complete control, 1-2 episodes - nearly complete control, 3-5 episodes partial control and >5 episodes as failure. Similarly, the number of episodes of retching (dry heaves) was also registered. The nausea was graded as 0 as none, 1 as mild, 2 as moderate and 3 as severe. Any side effects appreciated were also recorded. The results were tabulated at 1 hour, 2 hour, 6 hour and 24 hours post operatively. Severe nausea and vomiting was labelled as failure and rescue therapy was initiated with i.v. Metoclopramide and i.v. fluids. Retching is defined as the dry heaves; which was recorded as the number of episodes. The total number of retching in 5 minutes was taken as one episode.

Statistical analysis: The data obtained in the present study was expressed as percentage and mean±S.D. Data was analyzed using ANOVA and Tukey's HSD test for statistical significance and $p < 0.05$ was considered significant.

RESULTS

A clinical study on 50 patients in ASA I and II undergoing LSCS under spinal anaesthesia was undertaken to find out the efficacy and safety of IV Metoclopramide.

Large numbers of cases were in the 23-26 years age group mean age was 24.9 years (Table 1). The number of patients experiencing the emesis episodes, nausea and retching was shown in Table-2, 4 and 6. The result indicated that significantly increased ($p < 0.001$) episodes of emesis in 1st hour of postoperative period. It was nil at 24 hours of postoperative period (Table 3). There were no episodes of emesis at 24 hours of postoperative period.

Table 1: Distribution of patients according to age. N=50.

Age group in years	No of patients	Percentage of patients
19-22	7	14
23-26	22	44
27-30	15	30
30-34	06	12

Note: Large numbers of cases were in the 23-26 years age group mean age was 24.9 years.

Table 2: Number of patients experiencing the episodes of emesis at different interval of postoperative period. N=50.

Postoperative period	Emesis episodes	
	Number of patients	Percentage of patients
1 hour	32	64
2 hour	16	32
6 hour	2	4
24 hour	0	0

Note: Sixty four percentage of patients experienced more emesis at 1 hour of postoperative period.

Table 3: Comparison of number of episodes of emesis at different interval of post-operative period. N=50.

Postoperative period	Mean	S.D.	P Value
1 hour	12.32	1.24	P=0.001
2 hour	5.68	0.94	
6 hour	1.42	0.12	
24 hour	0	0	

Note: Number of episodes of emesis was significantly higher (p=0.001) at 1 hour of postoperative period.

Table 4: Number of patients experiencing nausea at different interval of postoperative period N=50.

Postoperative period	Nausea	
	Number of patients	Percentage
1 hour	28	56
2 hour	18	36
6 hour	4	8
24 hour	0	0

Note: Fifty six percentage of patients experienced more emesis at 1 hour of postoperative period.

Table 5: Comparison of grades of nausea at different interval of post-operative period N=50.

Postoperative period	Mean	S.D.	P Value
1 hour	5.22	1.02	P=0.001
2 hour	2.88	0.54	
6 hour	1.32	0.42	
24 hour	0	0	

Note: The grades of nausea was significantly higher (p=0.001) at 1 hour of postoperative period.

Incidence of nausea was significantly higher (p< 0.001) in 1st hour of postoperative period. There was no nausea recorded at 24 hours of postoperative period (Table 5). The incidence of retching was more in the 2nd hour. Incidence of retching was not recorded at 24 hours of postoperative period which is statistically significant (p< 0.01, Table 7).

Table 6: Number of patients experiencing retching at different interval of postoperative period. N=50.

Postoperative period	Episodes of retching	
	Number of patients	Percentage
1 hour	26	52
2 hour	34	64
6 hour	0	0
24 hour	0	0

Note: Sixty four percentages of patients experienced more retching at 2 hour of postoperative period.

Table 7: Comparison of retching at different interval of post-operative period. N=50.

Postoperative period	Mean	S.D.	P Value
1 hour	8.24	1.30	P=0.01
2 hour	2.14	1.22	
6 hour	0.0	0.0	
24 hour	0.0	0.0	

Note: The retching episodes were significantly higher (p=0.01) at 1 hour of postoperative period.

DISCUSSION

The problem of nausea and vomiting is a very old but a less thought of problem. Before any specific anti-emetic agents became available, various techniques, including olive oil and insulin glucose infusions were reported to be effective in reducing the incidence of postoperative nausea and vomiting.[6]

Today, the anti-emetic drugs are the mainstay of therapy for PONV. There are several types of anti-emetics used in the management of PONV. Gastrointestinal prokinetic drugs with anti-dopaminergic actions (e.g., metoclopramide, domperidone) are anti-emetics. Phenothiazines (e.g., Prochlorperazine, Perphenazine) and butyrophenones (e.g. droperidol) have anti-emetic properties resulting from anti-dopaminergic actions.[7]

Metoclopramide hydrochloride is a dopamine receptor antagonist and a potent pro kinetic drug which stimulates motility of the upper gastrointestinal tract leading to rapid gastric emptying and is used in the management of some form of nausea and vomiting and in gastro esophageal reflux and gastric stasis.[8]

The results of the present study indicated the episodes of emesis; nausea grades and retching episodes were severe at 1st hour of postoperative period and were completely controlled at 24 hours of postoperative period. This suggests that Metoclopramide is a suitable agent to prevent PONV.

According to a review on the factors associated with increased PONV and the measures available to reduce its incidence in paediatric patients demonstrated the paediatric patients (school children) have a higher incidence of PONV (34-50%), while preschool children have incidence of 20% and PONV occurred in 34% of peadiatric patients when anaesthesia was less than 30 minutes duration or 48% if it was longer than 30 minutes.[9] A study conducted for and compared it with intravenous metoclopramide to prevent PONV after middle ear surgery in 60 patients.[10-14] Where, patients randomly allocated to receive ondansetron 0.15 mg/kg and injection metoclopramide 0.2 mg/kg. The incidence of PONV was reduced from 70% to 15% with injection Ondansetron ($P< 0.05$). They concluded that injection ondansetron in a dose of 0.15 mg/kg is effective and safe anti-emetic drug than Metoclopramide. They also compared the incidence of nausea, vomiting and headache after ondansetron 0.06 mg/kg intravenous, pro chlorperazine 0.2 mg/kg LM and prochlorperazine 0.1 mg/kg IV. To 282 patients, undergoing adeno-tonsillectomy in a double blind controlled study, reported that, the incidence of nausea and vomiting reduced from 29% to 2% by intravenous ondansetron ($P< 0.005$) and headache was most frequent after intravenous ondansetron in 35% ($P< 0.05$).

CONCLUSION

Intravenous administration of Metoclopramide could be able to control the episodes of emesis; nausea and retching episodes successfully at 24 hours of postoperative period. This clearly suggests that Metoclopramide is a suitable agent to prevent PONV.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Craigo PA. Paul A: Gastrointestinal physiology: aspiration of gastric contents; postoperative nausea and vomiting. Chapter 21. Collins VI: Physiology and pharmacological bases of anaesthesia. 1st eds. Baltimore Williams and Wilkins; 1996:361-94.
2. Watcha MF, White PF. Postoperative nausea and vomiting. Anaesthesiology. 1992;77:162-84.
3. Bunce KT, Tyers ME. The role of 5-HT in postoperative nausea and vomiting. Br J Anaesth. 1992;69:60S5-62S.
4. Rowbotham DJ. Current management of postoperative nausea and vomiting. Br J Anaesth. 1992;69:60S-62S.
5. Patel RI, Hanrallah RS. Anaesthetic complications following pediatric ambulatory surgery. Anaesthesiology. 1988;69:1009-12.
6. Bodner M, White PF. Antiemetic efficacy of ondansetron after outpatient laparoscopy. Anesth Analg. 1991;73:250-4.
7. Leeser J, Lip H. Prevention of postoperative nausea and vomiting using ondansetron, a new selective, 5-HT3 receptor antagonist. Anesth Analg. 1991;72:751-5.
8. Alon E, Himmelseher S. Ondansetron in the treatment of postoperative vomiting: a randomized double-blind comparison with droperidol and metoclopramide. Anesth Analg. 1992;75:561-5.
9. Furst SR, Rodarte A. Prophylactic antiemetic treatment with ondansetron in children undergoing tonsillectomy. Anaesthesiology. 1994;81:799-803.
10. Roy S, Rudra A. Ondansetron: a new antiemetic to reduce postoperative nausea and vomiting after mastoidectomy. Ind J Anaesth. 1996;44:113-7.
11. Van Den Berg AA. Comparison of ondansetron and prochlorperazine for the prevention of nausea and vomiting after adenotonsillectomy. Br J Anaesth. 1996;76:447-51.
12. Ahamed SM, Khan RM, Bano S: Prevention of emesis following strabismus surgery by ondansetron. Ind J Anaesthesia. 1997;40:17-20.
13. Alexander R, Fennelly M. Comparison of ondansetron, metoclopramide and placebo as premedicants to reduce nausea and vomiting after major surgery. Anaesthesia. 1997;52:695-703.
14. Saha S, Biswas AK. Efficacy of preoperative ondansetron in the prevention or minimising the incidence of postoperative nausea and vomiting. Ind J Anaesth. 1997;41:23-5.

Cite this article as: Rashmi, Shivanand PT, Manjunath ML. Effectiveness of metoclopramide in preventing the incidence of post-operative nausea and vomiting in lower-segment caesarean section. Int J Res Med Sci 2016;4:2177-80.