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ORIGINAL ARTICLE

COMPARISION BETWEEN METOCLOPRAMIDE AND ONDANSETRON FOR PREVENTION OF NAUSEA AND VOMITING IN CAESAREAN DELIVERY UNDER SPINAL ANAESTHESIA

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ABSTRACT: AIM OF STUDY: To evaluate the anti-emetic efficacy of bolus doses of metoclopramide and ondansetron in preventing nausea and vomiting in caesarean section under spinal anaesthesia. **METHODS:** Sixty patients of ASA-Ī and ĪĪ undergoing elective caesarean section were randomly divided into 2 groups of 30 each. Group A (n=30) received IV metoclopramide 10mg and Group B (n=30) received IV ondansetron 4mg, 30 minutes prior to spinal anaesthesia. Anaesthetic management was standardized and incidence of nausea, retching and vomiting was compared between the two groups. **RESULTS:** The maternal characteristics regarding age, weight and gestational period were not significantly different between the two groups. There was also no statistically significant ($p>0.05$) difference of anti-emetic effects (Nausea, vomiting) between the two studied drugs. **CONCLUSION:** No single intervention is available to completely eliminate nausea and vomiting. Metoclopramide is as effective as ondansetron in preventing the incidence of nausea and vomiting in caesarean delivery under spinal anaesthesia.

KEYWORDS: Nausea, Vomiting, Caesarean delivery, Metoclopramide, Ondansetron.

INTRODUCTION: Nausea and vomiting are the most common and distressing symptoms during and after caesarean delivery under spinal anaesthesia with reported incidence as high as 66%.[(1)] Intraoperative emetic episodes are not only uncomfortable to the patient but also disturbing to the surgeons rendering surgery more difficult and increasing the risk of visceral injuries. The aetiology of nausea and vomiting is multifactorial and none of the available antiemetic provide absolute guarantee against nausea and vomiting.

Different anti-emetics have been used to reduce the incidence of nausea and vomiting with variable success rate. Mention may be made of droperidol (Butyrophenones), metoclopramide (Dopamine receptor antagonist) and ondansetron (5-HT_3 antagonists). Metoclopramide is used as an antiemetic for many years and has been considered the most effective single agent by Lussos et al.[(2)] It acts by blocking the dopamine receptors in the chemoreceptor trigger zone (CTZ).0ndansetron is a selective 5-HT_3 receptor antagonist and has been shown to be effective in the prevention of chemotherapy induced emesis.[(3)] In this clinical study we compared the efficacy of intra venous metoclopramide and ondansetron in a prospective, randomized, double blinded manner for prevention of nausea and vomiting in patients undergoing caesarean delivery under spinal anaesthesia.

MATERIAL AND METHODS: The study was carried out after getting approval from ethical committee of the hospital. Sixty parturient with ASA physical status I & II posted for elective caesarean delivery were selected after obtaining informed written consent.

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Exclusion criteria were: patients with history of PONV in previous surgeries, history of motion sickness, bronchial asthma, allergy to local anaesthetics, hepatic, renal, cardiac, haematological and metabolic disorders. No opioid analgesics were given and those who had taken any antiemetics within the last 24 hours were excluded.

The patients were randomly allocated into 2 groups. Group A received inj. metoclopramide 10mg IV, Group B received inj. ondansetron 4mg IV, 30 minutes before giving spinal anaesthesia. The patients were randomized by using random function of computer. Study drugs were prepared by an anaesthesiologist not involved in the study and dispensed in unlabelled syringes. The anaesthesiologist performing the block and the investigator were blinded to the drug solution administered. All patients were fasted overnight and received ranitidine 150mg orally the night before surgery and inj. ranitidine 50mg was given 2 hours prior to the scheduled surgery.

Intraoperative and postoperative emetic episodes were recorded by direct questioning or by spontaneous complaints by the patients at any time during the study period – which was defined as the period starting from the anaesthetic procedure to the first 5 (five) hours in the immediate postoperative period.

Nausea was defined as a subjective unpleasant sensation associated with awareness of the urge to vomit; retching was defined as the laboured, spasmodic, rhythmic contractions of the respiratory muscles without the expulsion of gastric contents; vomiting was defined as the forceful expulsion of gastric contents from mouth. We made no distinction between vomiting and retching (i.e. a retching event was considered as vomiting event). Hypotension was defined as a decrease in systolic blood pressure >20% from baseline or a systolic BP less than 90mmof Hg and was treated with additional IV fluids and/or inj. Mephenteramine 3-6mg IV. Bradycardia was considered when pulse rate was less than 50 per minute and was treated with inj. atropine 0.6 mg IV as indicated.
All the patient remained in the recovery room for 5 hours and occurrence of nausea and vomiting were recorded.

On arrival in the operation room, the baseline maternal blood pressure, pulse rate and oxygen saturation were recorded. Each patient received 20ml/kg of Ringer's Lactate solution before the administration of spinal anaesthesia to prevent hypotension. Under strict aseptic precautions, 0.5% hyperbaric bupivacaine 2.5ml was injected intrathecally over 30 seconds using 25-gauge spinal needle at the L_{3-4} interspace to all the patients lying in the right lateral position. Patients were then immediately placed supine with a wedge under the right hip for 15 degrees left uterine displacement. Oxygen, 3 liters per minute, was administered via face mask. Blood pressure, heart rate and oxygen saturation were recorded at one minute interval for the first 5 minutes after the spinal injection, then at every 5 minute's intervals during the surgery. In the immediate postoperative, recording was carried out for 5 hours at every 1 hour interval.

Surgery was allowed to commence following confirmation of spinal block by loss of sensation to cold and pin prick to T_{4-5} level. Oxytocin (20 units) was administered through a separate intravenous infusion of 5% dextrose at the time of umbilical cord clamping. Apgar scores were recorded at 1st and 5th minutes. Parametric data were analysed by the Students't-test and non – parametric data by Chi-square test respectively. Statistical significance was assumed at a value of $P<0.05$

RESULTS: The demographic profile of the patients as regards the age and weight was comparable as shown below in Table (1).

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Parameter	Group A (n=30)	Group B (n=30)	"P" value
Age (yrs.)	29.4±6.07	29.86±5.39	P>0.05 (Not significant)
Weight (kg)	64.4±9.00	61.77±9.50	P>0.05(Ns)
Gestation (weeks)	39±1	39±1	p>0.05 (Ns)

Table 1: Patients characteristics. (Data are expressed as mean±SD)

The incidence of intra operative nausea in the metoclopramide group was 20% while that of ondansetron group was 13.33%. The comparison of incidence rates of intraoperative nausea between the two groups were statistically insignificant ("p" value>0.05) as shown in Table 2(I). On the other hand, 16.66%experienced intraoperative vomiting/retching in the metoclopramide group while 10% in the ondansetron group. However, the comparison of incidence rates of vomiting/retching were also statistically insignificant ("p" value>0.05) as shown in Table 2(II).

Group	Nausea	No nausea	Total	X^2	"P" value
A (Metoclopramide group)	6(20%)	24(80%)	30	0.12	>0.05
B (Ondansetron group)	4(13.33%)	26(86.67%)	30		

Table 2(I): Comparison of incidence rates of nausea between the two groups during intraoperative period

Group	Vomiting/Retching	No vomiting/Retching	Total	X^2	"P" value
A	5(16.66%)	25(83.34%)	30	0.14	>0.05
B	3(10%)	27(90%)	30		

Table 2(II): Comparison of incidence rates or vomiting/retching during intraoperative period between the two groups

During the post –operative period, it was observed that the incidence of nausea was 13.33% in metoclopramide group and 10% in the ondansetron group. But the comparison of the post-operative nausea between the two groups were statistically insignificant ("p" value>0.05) as shown in Table 3(I). Interestingly, there was no incidence of vomiting/retching in both the groups. Thus the comparison of incidence of post-operative vomiting/retching between the two groups were statistically insignificant ("P">0.05) as shown in the Table 3(II).

Group	Nausea	No nausea	Total	X^2	"P" value
A	4(13.33%)	26(86.67%)	30	0.16	>0.05
B	3(10%)	27(90%)	30		

Table 3(I): Comparison of incidence rates of nausea during postoperative period between the two groups

Group	vomiting/retching	Vomiting/retching	total	X^2	"P" value
A	0(0%)	30(100%)	30	infinity	>0.05
B	0(0%)	30(100%)	30		

Table 3(II): Comparison of incidence rates of vomiting/retching during postoperative period between the two groups

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The effect of the study drugs on the neonatal outcome were assessed by Apgar score in the 1st and 5th minute. The Apgar score were 7 or more in all the infants as shown in Table 4.

Apgar Score	Group A	Group B
1stmin	7-9	7-8
5th min	9-10	8-9

Table 4: showing Apgar score at 1st and 5 minutes

DISCUSSION: The occurrence of nausea and vomiting during caesarean section under regional anaesthesia is relatively high without prophylactic anti-emetic.[4] The aetiology of emetic symptoms in parturiant is multifactorial and complex. The increased progesterone level during pregnancy decreases gastrointestinal motility and reduces lower oesophageal pressure. These physiological changes predispose the parturiant to develop emetic sequelae. Maternal hypotension after spinal anaesthesia is related to an increased incidence of intraoperative and postoperative emetic symptoms. In our study, preloading with 20ml/kg Ringer's Lactate solution, left uterine displacement, supplementation of oxygen via face mask and vasopressor agent inj. mephenteramine were used for prevention and early treatment of hypotension. Further, the occurrence of nausea and vomiting during caesarean delivery are related to surgical manipulation of the uterus, abdominal visceras and peritoneum even in presence of adequate sensory-motor blockade.

In our study, metoclopramide and ondansetron effectively reduce the emetic symptoms in caesarean section patients similar with the study of Lussos S et al.[2] Abouleish E I et al.[5] reported that the incidence of intra-operative vomiting (36%) was lower following administration of 4mg ondansetron iv during caesarean section under spinal anaesthesia compared to the control group (58%). In another study of Garcia Miguel F J et al.[6] it was observed that ondansetron treated and metoclopramide treated patients experienced significantly fewer intra-operative nausea and vomiting episodes than placebo treated patients.

Our study is in concurrence with the studies of Pan A K and Rudra A.[7] where incidence of intraoperative nausea and vomiting by prophylactic ondansetron as compared to placebo group was 10% versus 75%; and 20% incidence rate by prophylactic metoclopramide as observed by Fiujii et al.[8] Vasanthakumar et al.[9] in their study group concluded that injection ondansetron decreases the incidence of emetic episodes than metoclopramide. However, in our study no stastically significance in the incidence of nausea and vomiting could be observed between the two studied drugs. This might have been due to the small sample size study. In our study no side effects of ondansetron and metoclopramide were observed probably because we used a smaller dose. Both ondansetron and metoclopramide have been used for hyperemesis gravidarum and no adverse foetal effects were observed.[10] Neonatal outcome was not affected by the drugs used in our study as demonstated by favourable Apgar Score (7 or more) in our study.

CONCLUSION: The aetiology involved in intraoperative nausea and vomiting during caesarean delivery under spinal anaesthesia is multifactorial. Therefore, larger prospective studies are needed in order to establish the important risk factors, the best preventive guidelines and the effectiveness and safety of new antiemetic drugs. Prophylactic administration of either 10mg metoclopramide or

4mg ondansetron IV is useful and equally effective in preventing emetic symptoms in parturients undergoing caesarean section under spinal anaesthesia without any adverse foetal outcome.

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