

A Comparative Study of Metoclopramide, Glycopyrrolate and Combination of Metoclopramide and Glycopyrrolate in Control of Intraoperative and Postoperative Nausea and Vomiting after Spinal Anaesthesia for Caesarean Section

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Summary

The incidence of nausea and vomiting during regional anaesthesia for Caesarean delivery is relatively high (66%) and mainly due to peritoneal traction and exteriorization of uterus. Sixty women undergoing caesarean delivery were studied in three different groups. Group A (n=20) received inj metoclopramide 10 mg or group B (n=20) inj glycopyrrolate 0.2 mg and group C (n=20) inj metoclopramide 5 mg added with inj glycopyrrolate 0.1 mg intravenously during the pre-loading of Ringer's lactate solution 15 ml/kg, prior to administration of spinal anaesthesia in a double blind manner. The incidences of emetic episodes were compared in different study groups. It was observed that the incidence of emetic episodes were least (10%) in patients who had received combination of inj glycopyrrolate 0.1 mg and inj metoclopramide intravenously. The differences were statistically analysed by using chi-square test. P value < 0.05 was considered as significant

Introduction

Prevention of nausea and vomiting associated with caesarean delivery after spinal anaesthesia has been a continual challenge for both anaesthetist and obstetrician, as the incidence has been reported to be as high as 66% (Datta and Santes 1984). These symptoms can be unpleasant and distressing to the patient and make surgery difficult to perform. Furthermore post-delivery nausea and vomiting can complicate postoperative care in several ways: (i) Aspiration of vomit, (ii) Electrolyte disturbance and dehydration, (iii) Delay of nutrition, fluid intake and oral drug therapy, (iv) Wound dehiscence, (v) Discharge from the hospital may be delayed.

Different antiemetics have been used for this purpose with variable success rates. Metoclopramide is

effective for prevention of nausea and vomiting in caesarean patients under spinal anaesthesia due to its central and peripheral antiemetic action (Lussos et al, 1992). However, its use is associated with undesirable adverse effects, most important of which are extrapyramidal symptoms, usually of dystonic type. Atropine, a tertiary amino structure, has been demonstrated to be an effective treatment for nausea and vomiting during spinal anaesthesia (Miller RD, 2000). It is to verify the hypothesis that glycopyrrolate can be effective for the same purpose with minimal side effects. Since it is another anticholinergic drug, a quaternary amine does not cross the placenta in significant amount (Ali-Melkikilia et al. 1990). Therefore, the agent may not cause deleterious effects on foetus.

The aetiology of nausea, vomiting in women undergoing caesarean section with spinal anaesthesia

is multifactorial and no single intervention is available to eliminate these undesirable effects. Therefore, combination of drugs have been tried with encouraging results (Mody and Simpson, 1986)

So this study was undertaken to compare the efficacy of glycopyrrolate, metoclopramide and combination of metoclopramide with glycopyrrolate in a randomized, double blinded manner for the prevention of intraoperative and early post-delivery emesis after spinal anaesthesia in caesarean delivery, in American Society of Anaesthesiologists (ASA) grade I and II patient.

Methods

After ethical committee approval and informed consent, 60 women (ASA I and II) aged 20-35 years undergoing caesarean delivery were studied. Women who had a history of motion sickness, history of acid peptic diseases or hepatic dysfunction or previous emesis in an intra-operative and post delivery period or patient on any antiemetic medication were excluded from the study.

All the patients were explained the procedure and were randomly allocated into three groups to receive :

Group A (n=20) Inj metoclopramide 10 mg.
Group B (n=20) Inj glycopyrrolate 0.2 mg.
Group C (n=20) Inj glycopyrrolate 0.1 mg + Inj metoclopramide 5 mg.

All the study agents were introduced intravenously prior to administration of spinal anaesthesia.

In the operating room, an intravenous cannula

(18G) was inserted and patients received I.V. hydration with doses of 15 ml/kg Ringer's lactate solution. Pulse rate, blood pressure, rate of respiration and foetal heart rate were recorded before spinal anaesthesia.

Under all aseptic conditions, lumbar puncture was performed with 25 gauge quincke's variety of needle between L3 and L4 vertebrae in the sitting position and 0.5% hyperbaric bupivacaine 2.5 ml was injected. After spinal injection patient was immediately placed in supine position. A wedge was placed under right hip for left lateral tilt of uterus. All patients received supplementation of O₂ (3 litres per minute) by a polymask.

Intraoperative, as well as post delivery emetic episodes were recorded by direct questioning by attending anaesthesiologist and or obstetrician blinded to which group of study the patient belonged.

Parameters recorded pre-operatively, intra-operatively and post delivery period were maternal pulse, blood pressure, respiratory rate, oxygen saturation, emetic episodes and Apgar score of baby (1 and 5 minutes).

Post-delivery, the study patients were monitored in the ward for period of 4 hours by staff nurse and attending doctors for the presence of any emetic episodes. If the patients were having any emetic episodes, they were assessed and recorded. The incidences of emetic episodes were compared in different study groups and differences were statistically analysed by using chi-square test. P value < 0.05 was considered as significant.

Results

60 patients were studied in 3 different groups.

Table 1
Demographic profile of patients in different groups (mean \pm S. D. values)

Variables	Group A	Group B	Group C
Age (yrs)	26 \pm 3.7	23 \pm 4.5	25 \pm 4.1
Weight (kg)	53 \pm 5.4	52 \pm 3.4	56 \pm 5.63
Duration of surgery (min)	45 \pm 4.1	46 \pm 3.5	45 \pm 3.1

No Significant difference

Table II: Incidence of emetic episodes observed in different groups

	Emetic episode present	Emetic episode absent
Group A (metoclopramide)	6 (30%)	14 (70%)
Group B (glycopyrrolate)	3 (15%)	7 (85%)
Group C (combined)	2 (10%)	18 (90%)

P value not significant in three groups. Values are in numbers of patients (percentage)

Table III
Cardiovascular changes in different groups after spinal anaesthesia

Group	H. R. < 60/min	Fall in systolic B. P. from the base line		
		>10	>20	>30
A	3 (15%)	5 (15%)	3 (15%)	Nil
B	2 (10%)	2 (10%)	2 (10%)	Nil
C	2 (10%)	2 (10%)	2 (10%)	Nil

The study groups were comparable with respect to maternal demographics, shown in table I. Emetic episodes (nausea, retching and vomiting) was observed and noted in 30% of metoclopramide group (Group A), 15% of glycopyrrolate group (Group B) and 10% of combined group (Group C) shown in table II.

It was observed that the incidence of emetic episodes were least (10%) in patients who had received combination of Inj glycopyrrolate 0.1 mg and Inj metoclopramide 5 mg in comparison to other two groups.

Cardiovascular changes after spinal anaesthesia in different groups are shown in table III. Episode of hypotension (fall of blood pressure > 20% of preoperative level) was successfully treated with intravenous bolus of fluid and Trendelenberg position and brady cardia was treated by intravenous atropine 0.2 mg. There was no difference in Apgar score among the three groups.

Discussion

The incidence of nausea and vomiting during regional anaesthesia for caesarean delivery is relatively high without prophylactic antiemetic (Datta and Santos 1984). The emetic episodes are a great concern during caesarean delivery done under spinal anaesthesia especially during peritoneal traction and exteriorization of uterus (Manullang et al 2000).

The antiemetic effect of glycopyrrolate, mentioned by previous authors (Ure et al 1999) may be due to rise in the cardiac output by the increased heart rate. Whereas metoclopramide (Lussos et al. 1992) has

central and peripheral antiemetic action. Centrally it blocks dopamine receptor and peripherally it increases lower oesophageal tone, but side effects of the agent are not desirable.

Conclusion

Anaesthetists in collaboration with obstetricians are in search of an ideal antiemetic specially in Caesarean delivery. The main aim is to make the mother ambulatory as quick as possible, thereby improving her fitness to be 'baby-friendly' by early breastfeeding. Therefore from the result of this study we could conclude that the combination therapy of glycopyrrolate and metoclopramide is superior than single drug therapy for preventing intraoperative and early post-delivery nausea and vomiting after spinal anaesthesia in caesarean delivery.

Reference

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