



## Original Article

# Oral Ondansetron in the Prevention of Pre and Post Operative Nausea and Vomiting

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### Abstract

A randomized single blind study was done in the Department of Anaesthesiology, Rajshahi Medical College Hospital to demonstrate the role of ondansetron, a 5-HT<sub>3</sub> receptor antagonist, in alleviating pre and post operative nausea and vomiting in patients undergoing caesarian section (CS) under subarachnoid block (SAB). For the purpose, the incidence of pre and post operative nausea and vomiting were compared between matched case (n=119) and control (n=121) groups undergoing CS under SAB. Cases received 16 mg ondansetron orally one hour prior to surgery. Anti emetic prophylaxis with single dose ondansetron resulted in significant reduction of pre operative and immediate post operative (2 hours) nausea and vomiting. However, at sixth post operative hour difference in nausea and vomiting between case and control groups became less significant (<0.05). Incidence of nausea and vomiting during 1<sup>st</sup> post operative hour in ondansetron group was 4.2% and 0.84% respectively in comparison to 41.3% and 19.8% in control group. During 2<sup>nd</sup> post operative hour no incidence of nausea and/or vomiting were observed among subjects receiving ondansetron whereas in control group 29.2% and 5% subjects suffered from nausea and vomiting, respectively. Overall, ondansetron 16 mg is well tolerated and easy to use.

Results of the present study revealed that ondansetron can be effectively used in preventing pre operative and immediate post operative nausea and vomiting.

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### Introduction

Post operative nausea and vomiting (PONV) is a common and distressing event occurring with an overall incidence of ~20% for all surgeries and patient population when no prophylactic anti emetic is used<sup>1</sup>. Vomiting and regurgitation leading to aspiration of material from alimentary tract into the lungs remain a common problem for an anaesthesiologist. Nausea and vomiting are

adverse effects of regional anaesthesia (Spinal and epidural), with an increase of approximately 10-20%<sup>6</sup>. It is more common in different operations including caesarian section. Caesarian section is a popular operation and occupies a major part of total operations throughout the world. The resulting nausea and vomiting is due to

1. Decreased cerebral blood flow secondary to systemic hypotension (from vasodilatation).

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2. Increased gastrointestinal atony and peristalsis (secondary to preganglionic sympathetic blockade) and
3. Vagal stimulation that occurs during intra-abdominal GI manipulation (i.e. caesarian section, hysterectomy, colon operation)<sup>7,8</sup>.

There are several drugs used for the prevention of post operative nausea and vomiting (PONV). Among these are phenothiazines, antihistamines, dopamine antagonists, anticholinergic drugs, 5-HT antagonists etc. Each of these drugs has its own advantages and disadvantages. Ondansetron as well as granisetron are selective antagonist of the 5HT<sub>3</sub> receptor and is effective in the treatment of nausea and vomiting in patients receiving cytotoxic drugs. Ondansetron has the advantage as it can be used orally.

## Patients and Methods

This study was carried out in Rajshahi Medical College Hospital from July 2004 to March 2005. It was a randomized, single blind, parallel group study comparing subjects receiving a single dose of oral ondansetron (119 patients) with control group (121 patients) without ondansetron.

We studied patients undergoing caesarian section under SAB. Exclusion criteria were ASA grade III, IV or V, known hypersensitivity to 5-HT<sub>3</sub> antagonist, taken anti emetic drug 24hr before surgery, history of hyperemesis gravidarum and motion sickness. Both primi- and multigravida patients were included in the study. After taking written informed consent, patients were allocated to an interventional group (to receive a single dose of 16mg ondansetron) and a control group. Ondansetron was given orally with small amount of water one hour before induction of anaesthesia. Both groups of patients were preloaded with 10 ml per kg. body wt of Hartman's solution and scheduled to receive subarachnoid block with 0.5% Bupivacaine Heavy (9-13mg according to the height of patient). Blood pressure was measured before the block and monitored at 5, 10, 30 and 60 mins. interval. Any fall in BP (hypotension) was noted. A fall of mean arterial

pressure 20% below the pre anaesthetic level was recorded as hypotension. After delivery of the baby 5-10 units of syntocinon was given i.v. to each of the patients of both groups. No other antiemetic drug was given to any group. Duration of operation was noted. Apgar score of each baby was recorded at 1 and 5 minutes after delivery. Post operative analgesia was maintained with NSAID (ketoralac) with H<sub>2</sub> receptor blocker (ranitidin).

Parameters included in the study were patient's age, weight, gravida, previous history of operation with any nausea and/or vomiting, duration of anaesthesia, apgar score, BP. Patients were assessed by the investigators 1,2,6 hours after operation, for post operative nausea and/ or vomiting using a 3 point scale: asymptomatic, nausea only, vomiting.

## Results

One hundred and nineteen patients received ondansetron. There were no statistical difference between the two groups by age, body weight and duration of operation (Table 1). Peroperatively, 99(83%) subjects were asymptomatic, 18 (15%) suffered from nausea, 1(1%) from vomiting and 1 (1%) both from nausea and vomiting in ondansetron (cases) group. In comparison in control group per operatively 31(21%) patients were found asymptomatic, whereas 54 (45%) suffered from nausea, 28(23%) from vomiting and 8 (6%) from both nausea and vomiting. During 1<sup>st</sup> post operative hour 95% remained asymptomatic and only 5% had nausea and/or vomiting in the ondansetron group. In control group during the same period 41% complained of nausea and 20% vomited. At the 2<sup>nd</sup> hour of post operative period 100% and 66% were found asymptomatic in ondansetron group and control group respectively. Also 29% and 5% subjects from control group suffered from nausea and vomiting respectively in 2<sup>nd</sup> hour. There were no significant difference between ondansetron (case) and control groups at the 6<sup>th</sup> hour of post operative period. There were no significant difference of Apgar scores of the neonates delivered from two groups.

**Table 1:** Comparison of study and control group by different parameters.

Parameter	Ondansetron Group (n=119)	Control Group (n=121)	Significance
Age (Years)	25.8 ± 5.94	24.8 ± 5.29	P = 0.178
Body weight (Kg)	58.1 ± 9.54	56.0 ± 9.15	P = 0.089
Duration of operation (in minutes)	56.8 ± 11.9	58.4 ± 13.3	P = 0.322

\* Values are by Mean ± SD

## Discussion

Nausea and vomiting occur commonly postoperatively<sup>1</sup> and the association of these with anaesthesia has been recognised<sup>2</sup>. The aetiology of postoperative nausea and vomiting is multifactorial including anaesthetic agents, patient, type and duration of surgery<sup>3</sup>. Nausea and vomiting are common in spinal anaesthesia<sup>4</sup>.

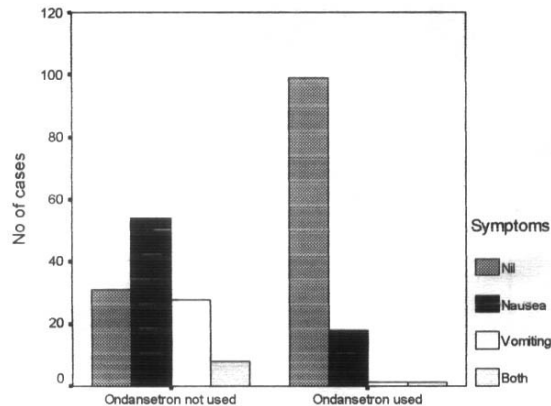
Recently, Malins *et al*, have studied the efficacy of ondansetron, metoclopramide to reduce post operative nausea and vomiting. In his study 150 patients were given oral premedication 1hour before gynaecological laparoscopy with ondansetron 4mg, metoclopramide 10mg. or placebo. A significant number of patients were found asymptomatic in the ondansetron group 48 hours after operation compared with the other two groups<sup>5</sup> (74%, 58% and 50% respectively; p<0.05).

In our study, in the treatment group 83%, 95% and 100% were asymptomatic in the per operative, 1<sup>st</sup> hour and 2<sup>nd</sup> hour post operative period, respectively. Whereas in control group the corresponding number was 26%, 39% and 66% (p<0.001).

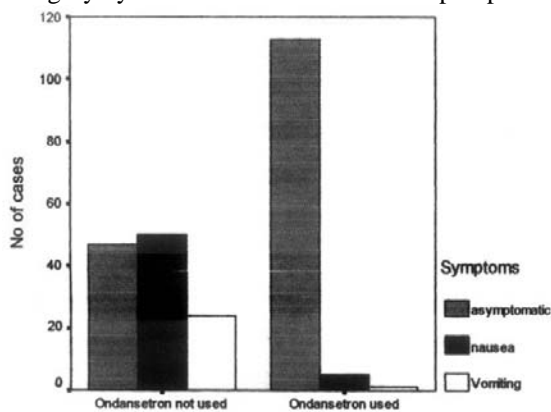
The number of patients receiving rescue anti-emetic treatment (treatment group 1%, control group 23%) were similar with those who were symptomatic with a significant difference between the treatment group and the control group (p<0.05).

In 6<sup>th</sup> hour of post operative period, significance of differences were less between the number of asymptomatic patients of treatment group (100%) and control group (95%) (p<0.05).

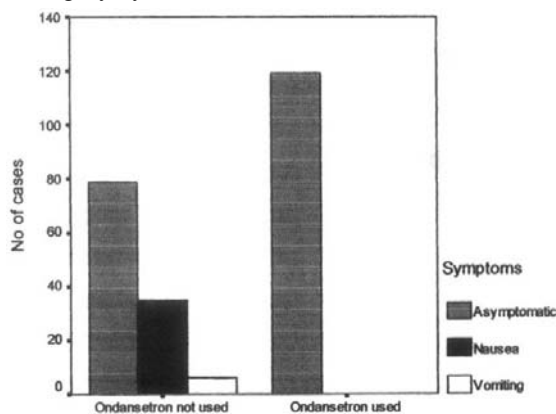
There were no significant differences in Apgar score of the newborn between treatment group and control group. Data were analyzed using SPSS for Windows. Statistical procedures employed were chi-square, t-test and one way ANOVA.



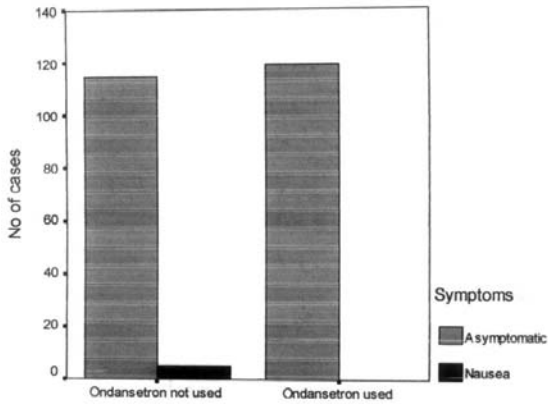
Category by Ondansetron used/not used: peroperative



Category by Ondansetron used/not used: at 1st hour



Category by Ondansetron used/not used: at 2nd hour



Category by Ondansetron used/not used: at 6th hour

## Conclusion

We conclude that oral premedication with ondansetron 16mg is more effective in reducing per and postoperative nausea and vomiting under Sub Arachnoid Block. and that ondansetron do not have any adverse effect on the newborn.

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