World Journal of Pharmaceutical Sciences
ISSN (Print): 2321-3310; ISSN (Online): 2321-3086
Published by Atom and Cell Publishers
Available online at: http://www.wjpsonline.org/
Original Article

Comparison of Ondansetron and Granisetron for prevention of Postoperative nausea and vomiting (PONV) following laproscopic appendicectomy

Dr K.L.Subramanyam

Associate Professor, Department of Anaesthesiology, Government Medical College, Anantapuram, Andhra Pradesh, India

Received: 14-10-2014 / Revised: 21-11-2014 / Accepted: 12-12-2014 / Published: 16-12-2014

ABSTRACT

Introduction: Post-operative nausea and vomiting is the most common and distressing symptom having incidence of 54-92 % in laproscopic surgeries. Ondansetron, a 5HT3 antagonist is the most popular drug used in clinical practice. Other 5HT3 antagonists available are Granisetron, Ramosetron etc., A Prospective randomized study was done on patients undergoing laproscopic appendicectomy under general anaesthesia comparing the efficacy of ondansetron and Granisetron for prevention of Postoperative nausea and vomiting (PONV).
Methods: Sixty patients belonging to ASA I & II undergoing laproscopic appendicectomy under general anaethesia were randomly allocated into two groups. Group A (n =30) received Ondansetron 4 mg (2ml) slow intravenous and group B (n=30) received Granisetron 2 mg (2ml) slow iv.
Results: It was observed that 5 patients (16%) in group A and 2 patients (7%) in group B had nausea and vomiting in immediate post-operative period (upto 6 hr).

Key words: Post-operative nausea and vomiting, Laproscopic Appendicectomy, Ondansetron, Granisetron

INTRODUCTION

The most common and distressing symptoms after any surgical intervention are pain and Postoperative nausea and vomiting (PONV). The incidence of PONV is as high as 30-40% and is even more alarming (53-72%) in laproscopic surgeries under general anaesthesia .[1]

PONV not only increases patient discomfort, is even more distressing than post operarive pain, but also delays discharge and adds to hospital expenditure and complications related to vomiting. The etiology of PONV in patients undergoing laproscopic procedures is not fully understood. The risk factors such as residual pneumoperitoneum, use of nitrous oxide, opioids, obesity etc., are some to mention. Earlier drugs used are antihistamines, phenothiazine derivatives, anticholinergics and dopamine receptor antagonists with certain side effects like delayed recovery, sedation and extrapyramidal symptoms.

Newer drugs like 5HT3 antagonists are devoid of side effects and highly effective in prevention of PONV. These drugs act on receptors which are present in vomiting inducing sites such as nucleus tractus solitaries, area postrema and vagal afferens. These drugs act by inhibiting the binding of serotonin to the 5HT3 receptors and thus control PONV2. These drugs are metabolized in the liver by enzymes of cytochrome P450 and donot have major drug interactions. The only important side effect is elongation of QT interval.[3]

The present study was done to compare the antiemetic effects of optimal dose of intravenous Ondansetron 4 mg and Granisetron 2 mg to prevent PONV following laproscopic appendicectomy.

MATERIALS AND METHODS

After approval from the Institutional ethical committee and informed written consent, sixty patients of ASA I & II, posted for laproscopic appendicectomy were divided into two groups of each 30. Group A was given Ondansetron 4 mg slow iv and group B was given Granisetron 2 mg slow iv, 2 min before induction of anaesthesia. The anaesthesia regimen and surgical procedure were standardized for all patients. Premedication of Tab. Alprazolam 0.5 mg PO night before surgery. Anaesthesia was induced with intravenous Propofol 2 mg/kg and intubated with muscle relaxant

***Corresponding Author Address:** Dr K.L. Subramanyam, 12-5-134/1, FCI Colony, Housing Board, Anantapuram-515001, A.P., India.*

Vecuronium. Anaesthesia was maintained with 66 % nitrous oxide in oxygen, Butorphanol 1 mg and isoflurane 0.4-0.6 %. Ventilation was controlled mechanically and adjusted to keep end tidal carbondioxide 35-40 mm Hg. Laproscopic appendicectomy performed. During surgery, patients were placed in trendelenburg position to aid better visualization and abdomen insufflated with carbon dioxide with an intraabdominal pressure of 10-12 mm Hg. At the end of procedure, patient made supine and residual neuromuscular blockade reversed and extubated. Local infiltration with 0.5 % Bupivacaine for laproscopic ports done. Before shifting to post op ICU, all patients received Diclofenac suppository 100 mg for analgesia. In the post op watd, all patients were monitored routinely for ECG, NIBP and SPO2 and recorded any complaint of nausea, retching and vomiting. Incidence of emetic episodes was compared in the study groups and the results were analysed by Chi-square test. $P<0.05$ considered to be significant.

RESULTS

In the present study, 60 patients undergone laproscopic appendicectomy. The difference in mean age, height, weight of the patients was non-significant ($P<0.05$). Both the groups were also comparable with respect to duration of surgery, duration of anaesthesia and carbondioxide insufflations.

Table – 1: Comparision between two groups

	Group A (Ondansetron) n =30	Group B (Granisetron) n=30
Age (years)	28 (24-36)	27 (24-38)
Weight (Kg)	55 +-2.5	56+-2.0
Height (cm)	150+-5	152+ -5
Duration of surgery	25 (22-40)	27(22-42)
Duration of anaesthesia	30 (25-45)	32(24-46)
Duration of CO_2 insufflation	27(25-45)	28(27-45)

Table 2: Comparision of side effects

	Group A	**Group B**
Emetic episodes	5 (16%)	2 (7%)
Nausea	7 (23%)	3 (10%)
Retching	8 (26%)	5 (16%)

DISCUSSION

PONV is a common complication following Anaesthesia and Surgery and the incidence is further high after laproscopic procedures. Most of the incidence of nausea and vomiting occur during the first few hours of surgery. The etiology of PONV is multifactorial. This is the leading cause of delayed discharge and unanticipated admission after day care laproscopic surgery.[4]

Vomiting is a complex act involving coordination of respiratory, gastrointestinal and abdominal musculature and is controlled by emetic centre.[5] Antiemetics are the mainstay therapy to prevent PONV. Antiemetics like proclorperazine, promethazines, metclopramide were widely used earlier. These drugs have varying effectiveness and their use is limited because of side effects.

The introduction of 5HT3 antagonists in 1990, heralded a major breakthrough and revolutionized the anti-emetic therapy not only operative vomiting and also chemo-related emesis.[6] These drugs donot produce sedation, extrapyramidal reactions and other side effects that observed with traditional anti emetics.[7] Commonly used drugs of this class are Ondansetron, Granisetron, Ramosetron etc., Hence our study was confined to anti emetic properties of Ondansetron and Granisetron to prevent PONV in patients coming for laproscopic appendicectomy.

The optimal dose of ondansetron and Granisetron to prevent PONV is 4 mg and 2 mg respectively.[8] Comparison of single dose of oral Granisetron and iv Ondansetron in prevention of nausea and vomiting induced by moderately emetogenic chemotherapy has been done. A single dose of Granisetron 2 mg resulted in equivalent levels of anti-emetic protection as iv Ondansetron (32mg).[9] Gigilo et al in their study to prevent nausea and vomiting following cancer chemotherapy concluded that both ondansetron and granisetron have similar antiemetic efficacy but dose of granisetron is much less than ondansetron. 2mg of granisetron IV is equivalent to 8-16 mg of ondansetron iv.[10] We studied the effects of ondansetron 4 mg IV Vs Granisetron 2 mg IV administered at induction of anaesthesia in patients who were to undergo laproscopic appendicectomy under general anaesthesia.

Limitations: the drawback of our study was that multimodal approach to PONV was not followed. The influence of certain factors like propofol, nitrous oxide, opioids and the disease appendicitis itself emetogenic, and were not studied. We did not include a placebo group as this is unethical to

expose the patient to distressing symptoms of post-operative period.

CONCLUSION

Sixty patients undergoing laproscopic appendicectomy were included in this study to compare the efficacy of ondansetron and granisetron for the control of PONV. In group A (ondansetron), emetic episodes 16%, nausea 23% and retching 26% observed whereas in group B (granisetron) they were 7%, 10% and 16% respectively. The present study concludes that granisetron is much more effective than ondansetron to prevent PONV following laproscopic appendicectomy.

REFERENCES

1. Taylor E, Feinstein R, White PF, Soper N. Anesthesia for laparoscopic cholecystectomy. Is nitrous oxide contraindicated? Anesthesiology 1992;76:541-3..
2. Rabasseda X. Ramosetron, a 5-HT3 receptor antagonist for the control of nausea and vomiting. Drugs Today (Barc) 2002;38:75-89.
3. Cohen MM, Duncan PG, DeBoer DP, Tweed WA. The postoperative interview: Assessing risk factors for nausea and vomiting. Anesth Analg 1994;78:7-16
4. Gold BS, Kitz DS, Lecky JA, Neuhans JH. Unanticipated admission to the hospital following ambulatory surgery. JAMA 1989; 262: 3008-10.
5. Watcha MF, White PF. Postoperative nausea and vomiting. Its etiology, treatment and prevention. Anesthesiology 1992; 77: 162-184.
6. Paxton DL, Mckay CA, Mirakin KR. Prevention of nausea and vomiting after day case gynaecological laparoscopy. Anaesthesia 1995; 50: 403-406.
7. TM Craft, PM Upton. Anaesthesia Clinical aspects. 3rd edition 2001; 279-281.
8. Fujii Y, Tanaka H, Toyooka H. Optimal anti emetic dose of granisetron for preventing PONV. Can J Anaesth 1994; 41: 794-797.
9. Perez EA, Hesketh P, Sandbach J, Reeves J, Chawla S, Markman M et al. Comparison of single dose oral granisetron vs IV ondansetron in the prevention of nausea and vomiting induced by moderately emetogenic chemotherapy: A multicentre, double blind, randomized parallel study. J Clin Oncol 1998; 16: 754-760.
10. Gigillo CA, Soares H, Castro CP et al. Granisetron is equivalent to ondansetron for prophylaxis of chemotherapy induced nausea and vomiting. Results of a meta analysis of randomized controlled trials. Cancer 2000; 89: 2301-8.