



COMPARATIVE ASSESSMENT OF ONDANSETRON AND DEXAMETHASONE IN EFFICACY OF CONTROL IN POSTOPERATIVE NAUSEA AND VOMITING.

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ABSTRACT **Background:** A common adverse outcome in laparoscopic surgeries is the incidence of nausea and vomiting in the postoperative period which can hamper recovery and cause unfavorable outcomes. The present study was formulated to ascertain which among two drugs- ondansetron and dexamethasone can control PONV better. **Methodology:** The subject base comprised of 80 subjects divided in two equal groups and administered the two study drugs. The data on PONV was collected and recorded. **Observations:** There were no statistical differences in the demographic data of the two groups. Ondansetron was marginally better in efficacy as compared to dexamethasone. **Conclusion:** Ondansetron can be used as a first line drug with a better efficacy as compared to dexamethasone in PONV control.

KEYWORDS : dexamethasone, PONV, Laparoscopic surgeries

INTRODUCTION:

Nausea and vomiting in the post-operative period is a common symptom which is reported among patients who have undergone minimally invasive or laparoscopic surgeries. The result of a continued or untreated nausea can further cause an elevation in anxiety, dehydration. The instance of vomiting can lead to a disturbance in acid base balance, wound repair is hampered and recovery may be delayed. (1,2)

The incidence of post-operative nausea and vomiting (PONV) is varied and can range from 20 % upto 80 %. PONV must be controlled effectively, especially in high-risk surgical patients There various factors which can predispose a patient to PONV, including the administration of opioids, type of surgical procedure, gender, history of previous PONV, duration of surgery and extent of anaesthesia, carbon dioxide retention.(3,4)

Laparoscopy is a procedure that requires necessity of carbon dioxide insufflation resulting in peritoneum distention, and increased pressure in the peritoneal cavity which is a very important risk factor inciting nausea and vomiting.(5)

The management of PONV is based on specific receptors/mediators that appear to be largely contributory in an individual patient's experience. A greater appreciation of which particular mechanisms are chosen, play a major role for an individual patient and may lead to targeted therapies in attempts to eliminate nausea and vomiting, minimize treatment induced adverse effects, and optimize patient outcomes. (6)

The present study was thus formulated to provide a comparative assessment in the efficacy of two anti-emetic agents namely ondansetron and dexamethasone. Ondansetron is a 5- hydroxytryptamine type 3 (5-HT₃) receptor antagonist that blocks receptors in the Chemotactic Trigger Zone (CTZ) as well as vagal nerve terminals. The exact anti-emetic mechanism of dexamethasone is unknown, but it is thought to enhance the anti-emetic effect of 5-HT₃ receptor antagonists (7)

METHODOLOGY:

The present study was conducted with a subject pool of 80 subjects divided in two groups of 40 subjects each. The study proposal was approved by the institutional ethical review board before commencement of data collection. Written informed consent was obtained from the study participants before inclusion in the study. The study was conducted over a period of 6 months from June 2020 to November 2020. The inclusion criteria was subjects above 18 years of age falling in ASA grade I & II, with no history of any chronic illnesses

such as diabetes, hypertension and with normal pre-operative metabolic parameters. Subjects with a prior history of motion sickness or elevated serum creatinine were excluded. All the subjects were undergoing an elective laparoscopic procedure. All subjects were divided in two groups labelled group O and Group D for ondansetron and dexamethasone respectively. The study drugs were administered in dose of 4mg for ondansetron and 8 mg of dexamethasone for the respective participants prior to anaesthesia induction. All intraoperative and post-operative protocols were followed as per institutional criteria for all subjects. The results were tabulated in a MS office Excel sheet and subjected to statistical analysis for central tendency and significance using SPSS ver 12 software.

OBSERVATIONS:

The demographic data of the study participants showed no significant variation among the two groups as depicted in table 01.

Table 01: Demographic parameters of study participants

Parameter	Group O	Group D	p-value
Age	44.15±11.41	43.73±10.75	NS
Gender (Male:Female)	28:12	26:14	NS
BMI	27.83±4.72	26.03±4.56	NS

Among the study participants the commonest surgery was laparoscopic cholecystectomy (56.25 % , n=45) followed by Hernia repair. There were no statistically significant differences in the type of surgery among the two groups.

With regards to the incidence of PONV in the study participants, the observations are as in table 02.

Table 02: Incidence of PONV

Parameter	Group O	Group D	p-value
Nausea	12	19	<0.05
Vomiting	9	7	NS
Total	21	26	<0.05

The incidence data showed a definitive statistically significant difference among the two groups at 95 % confidence interval.

DISCUSSION:

It is hypothesized that a multi-factorial etiology is responsible for the development of PONV after laparoscopic surgeries. Prolonged carbon dioxide insufflation, residual pneumoperitoneum after CO₂ insufflation, peritoneum distension, diaphragm irritation, and visceral organ irritation and manipulation have been considered to influence the incidence of PONV. Use of nitrous oxide, the utilization of slightly hypoxic mixtures during anesthesia, and postoperative opioid

administration have been suggested as other potential risk factors (8). Dexamethasone is suggested to exert its action through serotonin inhibitors in the gut. It does reduce inflammation around the site of surgery while decreasing the ascending parasympathetic impulses to the CTZ and reduce PONV. Dexamethasone was first reported to be effective in patients receiving cancer chemotherapy in 1981. Since then, several studies have shown that glucocorticoids are equal to or better than other drugs such as metoclopramide, ondansetron, or droperidol in preventing nausea and vomiting associated with chemotherapy (9).

Dexamethasone has been shown to be effective in reducing nausea and vomiting after open and laparoscopic surgical procedures. Several randomized controlled trials have shown that dexamethasone alone or in combination with other drugs (granisetron, ondansetron, tropisetron, dolasetron) is effective in reducing postoperative nausea and vomiting and antiemetic requirement after laparoscopic surgeries. (10)

The results of the present study in terms of dexamethasone efficacy were consistent with that reached by Wang et al. who evaluated the antiemetic effect of dexamethasone 8 mg i.v. in comparison with saline. (11)

A similarly modulated study was done by Feo et al, Neseck et al and Bisgaard et al wherein the three authors found concurrent results that showed the efficacy of dexamethasone in curbing PONV (9,12)

Bhattarai B et al conducted a study on comparative efficacy of dexamethasone and ondansetron in singular and combination doses. The results of the study are comparable with the present study wherein we observed a better PONV control with ondansetron than plain dexamethasone. (13) A similar study was conducted by Hammad RA et al wherein the authors comparatively assessed two groups by administering dexamethasone and ondansetron respectively. The findings are concurrent with the present study.

CONCLUSION:

The present study was formulated to ascertain which of the two drugs have a better efficacy in controlling PONV. The results have concluded that marginally ondansetron is proving a better efficacy. The limitation of the present study is the small sample size which can possibly be rectified by conducting a larger study with a wider demographic subject base.

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