https://doi.org/10.29309/TPMJ/2022.29.09.6997

The Professional Medical Journal
www.theprofesional.com
2022, Volume, 29 Issue, 09

ORIGINAL ARTICLE

Effectiveness of dexamethasone and ondansetron in postoperative nausea and vomiting in laparoscopy cholecystectomy.

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Article Citation: Jan Y, Lalley G, Hussain M, Neelma. Effectiveness of dexamethasone and ondansetron in postoperative nausea and vomiting in laparoscopy cholecystectomy. Professional Med J 2022; 29(9):1352-1358. https://doi.org/10.29309/TPMJ/2022.29.09.6997

ABSTRACT… Objective: To determine the effectiveness of combination of dexamethasone and ondansetron in prevention of postoperative nausea and vomiting in laparoscopic cholecystectomy. **Study Design:** Descriptive Case Series study. **Setting:** Departments of Surgery, Khyber Teaching Hospital and Hayatabad Medical Complex, Peshawar. **Period:** 01 Jan 2018 to 31 May 2019. **Material & Methods:** A total of 231 patients undergoing laparoscopic cholecystectomies were included in the study and subjected to dexamethasone in combination with ondansetron and followed up at 24 hours after surgery to detect nausea and vomiting. **Results:** The mean age of the study sample was 38.5 + 10.4 years. In our study, we had 62.3% males and 37.7% female patients. On follow up, we observed that PONV was recorded in 39.4% of patients of which grade 1 were 15.2%, grade 2 were 14.7% and grade 3 were 9.5%. In this regards, the effectiveness of dexamethasone and Ondansetron combination was recorded in 60.6% of patients. **Conclusion:** The combination of dexamethasone and ondansetron is moderately effective in prevention of post operative nausea and vomiting.

Key words: Dexamethasone, Laparoscopic Cholecystectomy, Postoperative Nausea and Vomiting (PONV).

INTRODUCTION

Laparoscopic surgery resulting in a faster recovery, a shorter hospital stay, and a quicker return to everyday activities.[1] The most frequent operation for gallstones and other gallbladder diseases is laparoscopic cholecystectomy.[2-4] However, postoperative nausea and vomiting are the most common complications of laparoscopic cholecystectomy, with a frequency of 20-30% 5 and 50-70% 1,5 following open and laparoscopic cholecystectomy, respectively.[3,5]

Postoperative nausea and vomiting is characterized as retching, nausea and vomiting that occurs within the first 24 hours after surgery.[6] It is caused by a number of factors, including the use of CO2, diaphragmatic irritation, the use of anaesthetics such as halothane, female gender, opioids, and the kind of operation.[2,7] It causes pain, dehydration, electrolyte imbalance, and aspiration in the patient.[8] Various medications, such as antiallergics, anticholinergics, dopamine receptor antagonists, and others, have been attempted, but have resulted in undesirable side effects such as dry mouth and extrapyramidal symptoms.[9] Ondansetron, a 5HT3 receptor antagonist, has no such side effects.[9] It inhibits vomiting signals in afferent pathways from the stomach and small intestine, as well as the nucleus tractus solitarus.[10] Dexamethasone has been used as an antiemetic in chemotherapy for a few years[11], and it enhances the effects of 5HT3 receptor antagonists.[1]

A study by Chattopadhyay et al[12] shows no PONV in 84.6% of patients undergoing laproscopic cholecystectomy. Nisar A et al[2] also describe no nausea, vomiting in 85% of patients undergoing laparoscopic cholecystectommy treated prophylacticaly with combination of ondansetron and dexamethasone. Another results of the study conducted by Bano et al[13] who compared

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Article received on: 27/01/2022
Accepted for publication: 26/07/2022

the effects of combined dexamethasone and ondansetron with ondansatron alone and showed that combination of drugs prevents PONV in 81.6% of patients undergoing laparoscopic cholecystecotmy. Similarly Khalid at el[1] noted no PONV in 88% of patients undergoing laparoscpic cholecystectomy.

Due to a lack of local data, the goal of this study is to investigate the combined effectiveness of ondansetron and dexamethasone in avoiding post-operative nausea and vomiting in laparoscopic cholecystectomy.

MATERIAL & METHODS

This descriptive case series was conducted at Departments of General Surgery, Khyber Teaching Hospital and Hayatabad Medical Complex, Peshawar from 01 Jan 2018 to 31-05-2019 after approval for ethical committee (781/HEC/B&PSC/2022).

Inclusion Criteria

All patients both male and female, with ASA I and ASA II, aged 20 to 70 years, scheduled for elective laparoscopic cholecystectomy.

Exclusion Criteria

- Patients with ASA III and ASA IV
- BMI more than 30kg/m^2
- History of motion sickness
- Pregnancy, menstruation
- Conversion of procedure to open cholecystectomy
- Allergy to dexamethasone or ondansetron
- Suffering from ear diseases/vertigo
- Patients taking antihistamines, anxiolytics or anti emetics prior to surgery.

Data Collection Procedure

Patients who met the inclusion criteria were included in the study through the out-patient department after receiving approval from the hospital ethics committee. Patients' demographic data were entered on a pre-designed pro forma after a complete history and physical examination were performed under the supervision of a consultant general surgeon. All patients provided informed written consent. Exclusion criteria were used to properly control for confounders and bias in the study. Patients were prepared for laparoscopic cholecystectomy, and both dexamethasone and ondansetron were administered intravenously during anaesthetic induction. Patients who underwent cholecystectomy were followed postoperatively over next 24 hours for nausea, vomiting, and the need for anti-emetics. They were then rated in accordance with their performance.

PONV: (postoperative nausea and vomiting) Grading

Grade 0>no nausea and vomiting
Grade 1>nausea but no vomiting
Grade 2>both nausea and vomiting less than 2 times
Grade 3 > nausea and vomiting more than 2 times recorded every 6 hrs till 1st 24hrs after laparoscopic cholecystectomy.

RESULTS

The sample size was 231 patients and all were given Dexamethasone and Ondansetron for the prevention of PONV. The mean age of the study sample was 38.5 + 10.4 years. We distributed the patients with regards to different ages. (See Table-I) In our study, we had 62.3% male and 37.7% female patients (Figure-1). The mean duration of illness was 6.8 + 2.5 weeks. We divided the duration in three different categories (Table-II). The mean BMI of the study sample was 24.9 + 1.6 kg/^{2} .and was categorized and elaborated in (Table-III). On follow up, we observed that PONV was recorded in 39.4% of patients of which grade 1 were 15.2%, grade 2 were 14.7% and grade 3 were 9.5%. (Table-IV) In this regards, the effectiveness of combination of dexamethasone and Ondansetron was recorded in 60.6% of patients (Table-V).

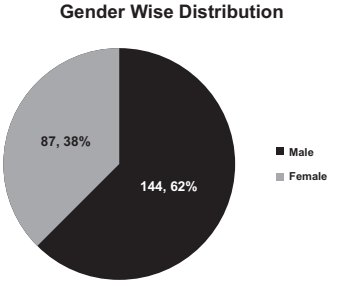

Figure-1. Gender distribution (n = 231)

Age	N	Range	Minimum	Maximum	Mean	Std. Deviation
	231	33.3	22.00	55.3	38.5	10.4

Age Groups		Frequency	Percent
	20 to 30 years	64	27.7
	> 30 to 40 years	52	22.5
	> 40 to 50 years	64	27.7
	> 50 to 60 years	51	22.1
	Total	231	100.0

Table-I. Descriptive statistics of age (n = 231)

	n	Range	Minimum	Maximum	Mean	Std. Deviation
Duration of illness (weeks)	231	9.00	3.00	12.00	6.8	2.5

		Frequency	Percent
Valid	1-4 weeks	48	20.8
	> 4 to 8 weeks	125	54.1
	> 8 to 12 weeks	58	25.1
	Total	231	100.0

Table-II. Duration of Illness (n = 231)

	N	Range	Minimum	Maximum	Mean	Std. Deviation
Body Mass Index	231	7.50	21.00	28.5	24.3	1.6

BMI Categories (kg/m²)		Frequency	Percent
	up to 23.00	74	32.0
	23.01 to 27.00	152	65.8
	27.01 & above	5	2.2
	Total	231	100.0

Table-III. Body mass index (n = 231)

PONV		Frequency	Percent
	Yes	91	39.4
	No	140	60.6
	Total	231	100.0

PONV Grades		Frequency	Percent
	Grade 0: No PONV	140	60.6
	Nausea with no vomiting	35	15.2
	Vomiting with no nausea	34	14.7
	PONV > 2 times post operatively	22	9.5
	Total	231	100.0

Table-IV. Frequency of PONV and its grades (n = 231)

Effectiveness	Frequency	Percent
Yes	140	60.6
No	91	39.4
Total	231	100.0

Table-v. Effectiveness of combined dexamethasone and Ondansetron (n = 231)

DISCUSSION

Laparoscopic cholecystectomy is a safe procedure that results in a shorter hospital stay, less post-operative pain, a faster return to normal activities, and lower mortality and morbidity.[14,15,16] Multiple analgesics, including opioids, have been used with variable success to treat postoperative pain.[14,15,17] Postoperative nausea and vomiting are prevalent following laparoscopic procedures and might be more uncomfortable than postoperative pain, causing patients to be discharged late.[18] PONV can occur up to 63 % following laparoscopic cholecystectomy if antiemetic prophylaxis is not used[19] and the medications Dexamethasone and

Ondansetron are widely used to prevent it.[20]

Dexamethasone has been used as an anti-emetic for more than three decades in chemotherapy patients with few adverse effects[21], reduces the incidence of PONV following abdominal and non-abdominal surgery, and is mostly beneficial for the prevention of late-onset nausea and vomiting.[22-24] Ondansetron, on the other hand, is an effective anti-emetic in surgical patients.[25] Various anti-emetic medications are frequently required to manage severe PONV caused by a variety of causes of postoperative emesis.[26] PONV has been observed to occur up to 50-70 percent of the time during laparoscopic cholecystectomy.[27]

In a study by Fujii et al a dose-dependent effect of dexamethasone with a plateau effect at 8mg.[28] Ondansetron is an effective antiemetic and Dexamethasone is specific in the prevention of postoperative nausea.[29] For this reason both are used in combination to reduce the overall frequency of both nausea and vomiting postoeperatively.[30]

Alghanem et al[31] reported that ondansetron is less successful in the initial postoperative hours for preventing nausea. In a study by Gautam et al[32] where he describe that dexamethasone was less effective in preventing early vomiting. Subramaniam et al also noted that ondansetron and dexamethasone are more effective in preventing early and late PONV respectively.[33]

The current study analyzed at the effectiveness of combining ondansetron and dexamethasone to prevent PONV following laparoscopic cholecystectomy. Imam SM et al noticed no nausea or vomiting in 77.5 % (31/40) of patients receiving a combination of ondansetron and dexamethasone compared to 47.5 % (19/40) of patients getting ondansetron alone.[34] In our study, the effectiveness in the combination group was 60.6 %.

Mckenzie et al found that 52 % of patients in group 1 (dexamethasone with ondansetron) had a full response, compared to 38 % in group 2 (ondansetron) ($p=0.045$). Vomiting occurred in 15% and 34% of patients in Groups I and II, respectively ($p=0.003$). In comparison, the findings of our study outperform those of McKenzie et al.[35]

Lopez-olaondo L et al observed that 84 % in the combination group responded completely, compared to just 20% in the placebo group, and that the incidence of nausea and vomiting episodes was reduced in the combination group (p0.01). Similarly, Bano F et al[13] observed that in patients receiving laparoscopic cholocystectomy, the combination group had a full response rate of 81.6 %, compared to 60.4 % in the dexamethasone group. The present study's outcomes are comparable to the combination group, with 60.6 % vs. 81.6 %.[36]

Bhattarai B et al compared the effectiveness of a combination group (ondansetron and dexamethasone) to ondansetron alone in patients having laparoscopic surgery for the prevention of PONV.[37] They showed that 92 % in the combination group had a full response, compared to 76 % in the ondansetron group. Dabbous AS et al evaluated the efficacy of dexamethasone with either granisetron or ondansetron in patients having laparoscopic surgery for postoperative nausea and vomiting prevention in 84 patients (42 in each group). In both groups, the outcome was not statistically significant.[38]

CONCLUSION

Dexamethasone and ondansetron are modestly effective in preventing post-operative nausea and vomiting. More randomized controlled studies and comparisons of several single and/or combination treatments are needed, however, to determine the best medicine that can successfully prevent PONV after laparoscopic cholecystectomy.

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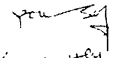
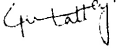
1	Yousaf Jan	Concept and design acquisition.	
2	Gul Lalley	Revising & Concept analysis, revising.	
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