

Comparison of Frequency of Postoperative Nausea and Vomiting with Blend of Metoclopramide and Dexamethasone Versus Dexamethasone Alone

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ABSTRACT

Objective: To compare the frequency of postoperative nausea and vomiting with combination of Intravenous metoclopramide and dexamethasone versus Intravenous dexamethasone alone in surgeries under General Anesthesia.

Study Design: Comparative prospective study

Place and Duration of Study: Anesthesia and Intensive Care department, Combined Military Hospital, Bahawalpur Pakistan, from Oct 2020-Apr 2021.

Methodology: A sample of 310 patients was collected through consecutive sampling. Patients were divided in two groups at random: Group A and Group B, by using lottery method. Group(A) patients were given combination of metoclopramide (10mg) and dexamethasone (8mg) Intravenous. Group(B) patients were given dexamethasone (8mg) Intravenous alone. After 24 hours, patients were evaluated for vomiting or nausea post-operatively.

Results: The mean of age of patients in study group A was 38.87±13.07 years and in B study group was 40.10±12.13 years. Out of these 310 patients, 177(57.10%) were male and 133(42.90%) were females with male to female ratio of ratio of 1.3:1. In my study, I have found that better nausea in 14(9.03%) group A patients compared to 31(20.0%) group B patients (p -value =0.006). Vomiting was found in 03(1.94%) group A patients and 13(8.39%) in group B patients (p -value=0.010).

Conclusion: This study concluded that combination of intravenous metoclopramide and dexamethasone is better as compared to intravenous dexamethasone alone in reducing nausea and vomiting post-operatively in patients receiving general anaesthesia.

Keywords: Dexamethasone, Metoclopramide, Post-operative nausea and vomiting.

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INTRODUCTION

Postoperative nausea and vomiting is one of the most common complications resulting in patient's discontent after anaesthesia¹. PONV is as high as 30% overall and approximately 80% in vulnerable individuals². At times the intolerance of patients to PONV is higher in comparison to pain. Quite often PONV is linked with late discharge from post anesthesia care unit, extended hospital stay and health care burdens. The common complications attributable to PONV include gaping wound, dehydration, electrolyte imbalance, and disruption of oral diet. Esophageal rupture (Boerhave syndrome) or aspiration pneumonitis are found associated to PONV under rare circumstances³.

Postoperative nausea and vomiting (PONV) is a significant hitch in surgeries carried out under general

anesthesia⁴. Day care surgery which is meant for early discharge and early recovery can get complicated by PONV with reported incidence of 50% after laparoscopic surgical interventions⁵. The main emphasis is laid on prevention of PONV rather than treatment since it is very cumbersome and takes time to settle once fully established. In some surgical conditions PONV can have disastrous impact on patient outcome; such as in maxillofacial surgery where patient's jaws are restrained with wires or patients with raised intracranial pressure, when PONV prevention is a compulsion under such circumstances.

The selection of prophylactic agent depends on risk involved, effectiveness of currently available choices of drugs, their safety profile and the expenses of prophylaxis versus the price of treating full blown PONV. Dexamethasone as an adjunct to metoclopramide had substantial outcomes in deterrence of postoperative nausea and vomiting (PONV) after surgeries under general anesthesia⁶.

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Antiemetic therapy as combo is often helpful in preventing Postoperative nausea and vomiting (PONV) in post-surgical patients and blend of antiemetics from different groups targeting action sites may be more successful than monotherapy⁷.

The newer antiemetics are promising but these are not cost effective for resource limited setups in developing countries. Our research's rationale was to compare the frequency of postoperative nausea and vomiting with combination of metoclopramide and dexamethasone versus dexamethasone alone so that we could avoid adverse extrapyramidal effects of metoclopramide without effecting cost of medication. Ondansetron was only used as rescue antiemetic. The study has not been conducted on this population before, and therefore, we carried out this research to improve our practice and update local guidelines.

METHODOLOGY

This comparative prospective study was conducted at Department of Anaesthesia and Intensive Care, Combined Military Hospital, Bahawalpur from 1st October 2020 to 13th April 2021. Acceptance from hospital research ethical committee was taken first with IERB approval certificate # EC-04-2021. A sample size of 310 patients was obtained by purposive sampling with power of test 80%, and 5% level of significance and taking expected percentage of vomiting that is 4% with Intravenous dexamethasone and 0% with combination of Intravenous dexamethasone and metoclopramide⁸. 155 cases were included in each group.

Inclusion Criteria: All patients aged 16 to 70 years of either gender with ASA I & II were enrolled in the study from CMH Bahawalpur who were planned for surgery under General Anesthesia (laparotomy, laparoscopic, eye and head surgery).

Exclusion Criteria: Patients with bleeding disorders (PT>10sec, aPTT>15sec), neuromuscular diseases (on medical record), known allergy to the study drugs and ASA-III and above were excluded.

A written approval was taken from the patients included and personal profile (name, age, gender, BMI, type of surgery) was also noted. All patients were adequately prepared after thorough pre-anesthesia assessment well in advance of the surgery date. Patients were divided in two groups randomly using lottery method. Study group:A patients were given combination of metoclopramide (10mg) and dexamethasone (8mg) Intravenous. Study group:B

patients were given dexamethasone (8mg) Intravenous alone. Then drugs were administered 10 minutes before induction. Afterwards, surgery was done under standard general anesthesia. ASA (American Society of Anesthesiologists) monitors were used in all patients. After surgery, patients were shifted to post-surgical wards for 24 hours. After 24 hours of surgery, patients were evaluated for nausea and vomiting. All this evidence was recorded on a Performa for future use

All data was entered and analyzed using SPSS (20). Standard deviation and mean were computed for height, BMI, age and weight. For gender Frequency and percentage were calculated. ASA status, type of surgery and Postoperative nausea and vomiting (PONV). Chi-square test was employed to compare both groups for Postoperative nausea and vomiting (PONV). p -value ≤ 0.05 was considered as significant. Stratified groups were compared by using chi-square test.

RESULTS

Age range in this study was from 16 to 70 years with mean age of 39.32 ± 12.67 years. The mean age of patients in group A was 38.87 ± 13.07 years and in group B was 40.10 ± 12.13 years. Majority of the patients 191 (61.61%) were between 16 to 40 years of age. Out of these 310 patients, 177(57.10%) were male and 133(42.90%) were females with male to female ratio of ratio of 1.3:1. Percentage of patients according to Type of surgery is shown in Table-I.

Table-I: Type of Surgery for both Groups (n=310)

Type of Surgery	Group A (n%)	Group B (n%)	Total (n%)
Laparoscopic	69 (44.52)	65 (41.94)	134 (43.23)
Eye	20 (12.90)	21 (13.55)	41(13.23)
Head	21 (13.55)	22 (14.19)	43(13.87)
Laparotomy	45 (29.03)	47 (30.32)	92(26.68)

In our study, we found better nausea 14(9.03%) in group A patients than 31(20.0%) in group B patients (p -value=0.006). Vomiting was found in 03(1.94%) group A patients and 13(8.39%) group B patients (p -value = 0.010) as shown in Table-II.

Table II: Comparison of Frequency of Postoperative Nausea and Vomiting in Both Groups(N=310)

		A group(n%)	B group(n%)	p -value
Nausea	Yes	14 (9.03)	31 (20.00)	0.006
	No	141(90.97)	124 (80.0)	
Vomiting	Yes	03 (1.94)	13 (8.39)	0.010
	No	152 (98.06)	142 (91.62)	

Frequency of Postoperative Nausea and Vomiting

Association of nausea and vomiting with respect to age groups, gender and type of surgery is shown in Table-III.

antagonist (prochlorperazine and promethazine)¹². Many research papers hold the evidence that dexamethasone can prevent vomiting induced by strong emetogenic chemotherapeutic agents¹³. The

Table-III: Association of Nausea and Vomiting with respect to Age Groups, Gender and Type of Surgery (n=310)

Factors	Study Parameter (N(%))						
	Nausea			Vomiting			
	Yes	No	p-value	Yes	No	p-value	
Frequency of Postoperative nausea and vomiting							
Group A*	14(9.03)	141(90.97)	0.006	3(1.94)	152(98.06)	0.010	
Group B*	31(20.0)	124(8.0)		13(8.39)	142(91.62)		
Age of Patients							
16-40	Group A*	08 (8.16)	90 (91.84)	0.002	03(3.06)	95 (96.94)	0.060
	Group B*	23 (24.73)	70 (75.27)		09 (9.68)	84 (90.32)	
41-70	Group A*	06 (10.53)	51 (89.47)	0.688	00 (0.0)	157 (100.0)	0.051
	Group B*	08 (12.90)	54 (87.10)		04 (6.45)	58 (93.55)	
Gender							
Male	Group A*	10 (10.64)	84 (89.36)	0.227	01 (10.06)	93 (98.94)	0.010
	Group B*	14 (15.05)	69 (84.95)		02 (3.28)	59 (96.72)	
Female	Group A*	04 (6.56)	57 (93.44)	0.007	02 (3.28)	59 (96.72)	0.345
	Group B*	17 (20.73)	55 (79.27)		05 (6.94)	67 (93.06)	
Type of Surgery							
Laparoscopic	Group A*	10 (14.49)	59 (85.51)	0.093	01 (1.45)	68 (98.55)	0.043
	Group B*	17 (26.15)	48 (73.85)		06 (9.23)	59 (90.77)	
Eye	Group A*	01 (5.0)	19 (95.0)	0.578	01 (5.0)	19 (95.0)	0.300
	Group B*	02 (9.52%)	19 (90.48%)		00 (0.0%)	21 (100.0%)	
Head	Group A*	01 (4.76%)	20 (95.24%)	0.578	00 (0.0%)	21 (100.0%)	0.157
	Group B*	02 (9.09%)	20 (90.91%)		02 (9.09%)	20 (90.91%)	
Laparotomy	Group A*	02 (4.44%)	43 (5.56%)	0.017	01 (2.22%)	44 (97.78%)	0.102
	Group B*	10 (21.28%)	37 (78.72%)		05 (10.64%)	42 (89.36%)	

Note: Group A (N=155) (Mean 38.87, Std Deviation=13.073)

Group B (N=155) (Mean = 40.10 Std Deviation=12.13)

DISCUSSION

Nausea and vomiting is a common and cumbersome complication of general anesthesia. Despite advancement of various anesthetic techniques and identification of risk factors connected to PONV, it stands as high as 20 to 30%⁹. This rate is even higher in patients who are more vulnerable due to their risk factors and they are subjected to as high as 70–80% incidence of PONV¹⁰. Children are not spared and frequency for children above the age of 3 is half as compared to high risk adult group that is 40%¹¹, which begins to decline as they reach adulthood. PONV is quite upsetting; it delays discharge time and consequently leads to un-necessary burden on medical resources. It also makes patient intolerant to pain. Nowadays the preventive medications for PONV are: serotonin receptor Type 3 antagonist (ondansetron, granisetron and ondansetron), dopamine receptor Type 2 antagonist (metoclopramide and droperidol), Type 1 muscarinic cholinergic receptor antagonist (scopolamine) and Type 1 histamine receptor

later studies also established that it can successfully prevent PONV induced by epidural administered morphine employed for post-operative pain¹⁴. Wakamiya in a recent placebo-controlled, randomized clinical trial proved that single dose of dexamethasone was efficient for mitigating PONV in children undergoing surgery for scoliosis¹⁵. Because of its low cost and safety in use, dexamethasone may well be the first drug of choice in preventing PONV¹⁶.

We have conducted this study to compare the frequency of postoperative vomiting and nausea with combination of Intravenous metoclopramide and dexamethasone versus Intravenous dexamethasone alone in patients undergoing surgery under General Anesthesia. Mean age of patients was 39.32±12.67 years. Group A had age mean 38.87±13.07 years and in group B had 40.10±12.13 years. Most of patients 191(61.61%) were 16 to 40 years old. Out of these 310 patients, 177(57.10%) were male gender and 133(42.90%) were females with ratio of 1.3:1. We have found that better nausea in 14(9.03%) group A patients

31(20.0%) group B patients (p -value=0.006). Vomiting was found in 03(1.94%) group A patients and in 13(8.39%) group B patients (p -value=0.010). Wakamiya *et al.*, in their study found dexamethasone was useful adjunct to metoclopramide against PONV prevention than metoclopramide alone. They also determined that premedication with 10 mg of intravenous metoclopramide or 8 mg intravenous dexamethasone separately can counteract the occurrence of PONV, but the additive effect of these medications is more noticeable¹⁷. Moreover both are cost effective drugs; this is because while metoclopramide protects against early PONV, dexamethasone acts late for the prevention of late PONV. Teshome *et al.*, also established that metoclopramide reduces bowel transit time and when given in high dose it also acts on serotonin receptors and block them.¹⁸

Kang *et al.*, found that dexamethasone was effective in controlling PONV and post-operative pain in pediatric patients undergoing adenoid and tonsil surgery for 24 hrs¹⁹. Arumugam *et al.*, also found that dexamethasone reduced vomiting from sixty three to twenty percent ($p < 0.0$) and routinely used both dosages (4mg versus 8mg) were useful against PONV prevention²⁰.

The usefulness of this combination has been studied in patients who underwent laparoscopic cholecystectomy²¹ PONV incidence was 13% with this combo and there was no requirement of rescue antiemetic implying that this drug combination is quite useful against PONV. It has been confirmed lately that metoclopramide's brief duration of action necessitates its administration at the conclusion of anesthesia than at the start. Aashoor *et al.*, showed that dexamethasone was useful adjunct to oral aprepitant and mirtazapine and avoided post-operative nausea and vomiting successfully²² but unfortunately these drugs are not easily available in our setting. Dexamethasone mitigates PONV along with alleviation of post-operative pain²³ but using it as adjunct to metoclopramide had better results²⁴.

CONCLUSION

This study concluded that combination of intravenous metoclopramide and dexamethasone is better as compared to intravenous dexamethasone alone in reducing post-operative nausea and vomiting in patients undergoing surgery under general anesthesia. Dexamethasone coupled with metoclopramide is still a promising combo which hold good for those settings where patients affordability is an important concern. We reinforce and recommend the routine

use of this combination as we should make new friends but not forget the old ones.

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Authors' Contribution

Following authors have made substantial contributions to the manuscript as under:

AA & JZ: Study design, drafting the manuscript, data interpretation, critical review, approval of the final version to be published.

KM & AH: Data acquisition, data analysis, approval of the final version to be published.

HI & FH: Critical review, concept, drafting the manuscript, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

REFERENCES

1. Cao X, White PF, Ma H. An update on the management of postoperative nausea and vomiting. *J Anesth.* 2017 Aug; 31(4): 617-626
2. Sizemore DC, Singh A, Dua A, et al., Postoperative Nausea. [Updated 2021 Apr 19]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2021 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK500029/>
3. Son YG, Shin J, Ryu HG. Pneumonitis and pneumonia after aspiration. *J Dent Anesth Pain Med.* 2017; 17(1): 1-12
4. Jin Z, Gan TJ, Bergese SD. Prevention and Treatment of Postoperative Nausea and Vomiting (PONV): A Review of Current Recommendations and Emerging Therapies. *Ther Clin Risk Manag.* 2020; 16(10): 1305-17.
5. Dewinter G, Staelens W, Veef E, Teunkens W, De M V and Rex S. Simplified Algorithm For The Prevention Of Postoperative Nausea And Vomiting: A Before-And-After Study. *Br. J. Anaesth.* 2018; 120(1): 156-63
6. Regasa T, Aweke Z, Neme D, Hailu S, Jemal B and Mekonen S. Comparison of prophylactic dexamethasone, metoclopramide, and combination of dexamethasone and metoclopramide for prevention of post-operative nausea and vomiting for major gynaecological surgery. *Int. J. Surg. Open* 2020.27; 18-24
7. Veitia WEC, Martinez LL, Amable DT, et al., Combined therapy and prophylaxis in postoperative nausea and vomiting in laparoscopic surgery. *Rev Cub Med Mil.* 2019; 48(4): 855-874.
8. Ko-lam W, Sandhu T, Paiboonworachart S, Pongchairerks P, Junrungsee S, Chotirosniramit et al., A Metoclopramide, versus its combination with dexamethasone in the prevention of postoperative nausea and vomiting after laparoscopic cholecystectomy: a double-blind randomized controlled trial. *J Med Assoc Thai.* 2015 Mar; 98(3): 265-72
9. Elvir-Lazo OL, White PF, Yumul R and Cruz Eng H. Management strategies for the treatment and prevention of postoperative/postdischarge nausea and vomiting: an updated review 2020, 9(Faculty Rev): 983 <https://doi.org/10.12688/f1000research.21832.1>
10. Roila F, Fatigoni S. New antiemetic drugs. *Ann Oncol.* 2006 Mar; 17 Suppl 2:i96-100. <https://doi.org/10.1093/annonc/mdj936>
11. Spronk, I., Korevaar, J.C., Poos, R. et al., Calculating incidence rates and prevalence proportions: not as simple as it seems. *BMC Public Health* <https://doi.org/10.1186/s12889-019-6820-3>.
12. Atef, H.M., Ismail, S.A., Al-Touny, A. et al., Postoperative analgesia in children undergoing adenotonsillectomy under sevoflurane versus propofol-based anesthesia: a randomized controlled trial. *Ain-Shams J Anesthesiol* <https://doi.org/10.1186/s42077-019-0032-z>

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13. Al-Radeef MY, Abood SJ, Abdulsahib WK, Hamad SO. Comparing the Effect of Dexamethasone, Normal Saline, and Metoclopramide on Prevention of Postoperative Nausea, Vomiting and Pain in Patient Undergoing Laparoscopic Cholecystectomy or Open Appendectomy: A Randomized Clinical Trial. *Open Access Maced J Med Sci*. 2019; 19(8): 139-44.
14. Henzi I, Walder B, Tramer MR. Dexamethasone for the prevention of postoperative nausea and vomiting: a quantitative systematic review. *Anesth Analg* 2000; 90(6): 186-94
15. Double-blind, dose-finding study of four intravenous doses of dexamethasone in the prevention of cisplatin-induced acute emesis. Italian Group for Antiemetic Research. *J Clin Oncol*. 1998; 16(9): 2937-42
16. Swaro S, Karan D, Banerjee A. Comparison of Palonosetron, Dexamethasone, and Palonosetron Plus Dexamethasone as Prophylactic Antiemetic and Antipruritic Drug in Patients Receiving Intrathecal Morphine for Lower Segment Cesarean Section. *Anesth Essays Res*. 2018; 12(2): 322-327
17. Wakamiya R, Seki H, Ideno S, Ihara N, Minoshima R, Watanabe K, Sato Y, Morisaki H. Effects of prophylactic dexamethasone on postoperative nausea and vomiting in scoliosis correction surgery: a double-blind, randomized, placebo-controlled clinical trial. *Sci Rep*. 2019 Feb 14; 9(1): 2119
18. Teshome D, Fenta E And Hailu S. Preoperative prevention and postoperative management of nausea and vomiting in resource limited setting: A systematic review and guideline. *Niger J Clin Pract*. 2020; 17(4): 10-17
19. Kang Y, Ku Ej, Jung Ig, Kang Mh, Choi Ys, Jung Hj. Dexamethasone And Post-Adenotonsillectomy Pain In Children: Double-Blind, Randomized Controlled Trial. *Medicine (Baltimore)*. 2021; 100(2): E24122. <https://doi.org/10.1097/Md.00000000000024122>
20. Arumugam S, Woolley K, Smith R A. Comparison of Dexamethasone 4mg vs 8mg Doses in Total Joint Arthroplasty Patients: A Retrospective Analysis. *Cureus*; 12(9): 10295
21. W S, Abdalla E and Kamel E Z Intravenous dexamethasone combined with intrathecal atropine to prevent morphine-related nausea and vomiting after cesarean delivery: A randomized double-blinded study. 2019; 35(1): 65-70
22. Ashoor T, Kassim DY, Hasseb AM, Esmat IM. Effects of aprepitant /dexamethasone versus mirtazapine/dexamethasone on postoperative nausea and vomiting after laparoscopic sleeve gastrectomy: a randomized controlled trial Egypt. *J. Anaesth* <https://doi.org/10.21203/rs.3.rs-107678/v1>
23. Uchinami Y, Takikawa S, Takashima F, et al.,. Incidence of postoperative nausea and vomiting is not increased by combination of low concentration sevoflurane and propofol compared with propofol alone in patients undergoing laparoscopic gynecological surgery. *JA Clin Rep*. 2019;5(1):70
24. Alkaiissi A and Dwikat M. Dexamethasone, Metoclopramide, and their combination for the prevention of postoperative nausea and vomiting in female patients with moderate-to-high risk for PONV undergoing Laparoscopic Surgery. *J. Evolution Med. Dent. Sci*; 6(10): 5353-5910.

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