

Comparison of the Effect of Dexamethasone and Metoclopramide in Prevention of Post-Operative Nausea and Vomiting in Laparoscopic Cholecystectomy

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ABSTRACT:

BACKGROUND:

Postoperative Nausea and vomiting is Common complication depending on the type of surgery, technique and duration of anesthesia.

OBJECTIVE:

To evaluate the effect of Dexamethasone as antiemetic in comparison with Metoclopramide.

METHODS:

Is a prospective study carried on (100) patients undergone elective cholecystectomy in a period from Jan. 2009 to April. 2010 in Baghdad Teaching Hospital / Medical city/Baghdad/Iraq.

The patients were allocated into two groups of 50 patients each. Group A received 8mg Dexamethasone, group B received 10mg metoclopramide intravenously, both groups monitored postoperatively for nausea and vomiting for 24 hours every 4 hours.

RESULT:

Regarding Nausea, for 24 hrs the results were not significant except at 24th hr., in which nausea more significant in metoclopramide group.

Regarding Vomiting, there was no significant from postoperative period to 12hr, while from 16 hr. to 24 hr. there were significant fewer incidences in dexamethasone group.

CONCLUSION:

A single dose of Dexamethasone is effective same as Metoclopramide in prevention of PONV , and it is better in late prevention postoperatively

KEY WORDS: dexamethasone, metoclopramide, laparoscopic cholecystectomy, antiemetic.

INTRODUCTION:

postoperative nausea and vomiting (PONV) is a highly observed feature of the perioperative experience. The type of surgery, the technique, duration of anesthesia, and various patient factors all contribute to the condition. Some patients state that they prefer postoperative pain to PONV, and the value of avoiding PONV is demonstrated by questionnaires that document patients' willingness to pay for prophylaxis personally.⁽¹⁾

The list of known factors predisposing patients to PONV suggests why this is a problem in the typical aesthetic surgery practice. Nausea is 2 to 3 times more common in women than men^(2,3).

A history of either motion sickness or PONV is a strong predictor of PONV^(2,4).

The incidence of PONV has been reviewed by several authors^(3,5,6,7,8).

The incidence is dependent on a variety of factors related to the patient, the procedure and the anesthetic. The overall incidence varies from 22-38%⁽⁹⁾.

Procedure factors are the type of surgery and increasing duration. Surgical procedures associated with a higher incidence include strabismus surgery, intraabdominal or laparoscopic surgery, ear nose and throat procedures, plastic and gynecological surgery⁽¹⁰⁾

The role of anesthetic factors in the etiology of PONV are multiple and controversial⁽¹¹⁾. No single or combination treatment is 100% effective in treating PONV i.e. some patients receive prophylaxis without needing it whilst others need it and may still have PONV. The prevention of PONV however is very desirable amongst patients⁽⁵⁾.

In Iraq laparoscopic cholecystectomy is widely increased. It is associated with high incidence of postoperative nausea and vomiting.

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Metoclopramide has been used as a prophylactic drug ,it is an anti emetic and gastroprokinetic agent ,thus it is primarily used to treat nausea and vomiting and to facilitate gastric emptying in patient with gastro-paresis .

Recently Dexamethasone also used for the prevention of postoperative nausea and vomiting. It is potent synthetic member of glucocorticoid class of steroid drugs. It's action done via chemoreceptor triggering zone [CTZ], stimulation and inhibition the receptors accordingly.

The aim of this study is to clarify the role of Dexamethasone as an antiemetic and its effect in comparison to the metoclopramide

PATIENTS AND METHODS:

This is a prospective study carried on (100) patients with ASA I and II classification , (25 – 55) years of age, weight (60-100) kg undergone elective cholecystectomy in a period from Jan. 2009 to April. 2010 in Baghdad Teaching Hospital / Medical city/Baghdad/Iraq.

Patients with history of Motion Sickness ; previous PONV , any disease promote nausea and vomiting, taking drugs that produce them in significant value , those who received antiemetic within 48 hour before surgery, any contraindications to Metoclopramide or Dexamethasone, Pregnancy were excluded . Demographic data of patients' age,weight,and gender had been recorded in already prepared data collecting sheets

Two groups (50 patients each) were created randomly, group 1 received Dexamethasone 8 mg while ; group 2 received Metoclopramide 10 mg after induction of anesthesia .

Standardized anesthetic technique done for all the patients, they were received similar type of - induction with Thiopental 4-6 mg/kg , Medizolam 0.03 mg/kg , Ketamine 0.5 mg/kg , Fentanyl 1 microgram/kg I.V ; relaxation with

pancuronium 0.1 mg/kg , controlled ventilation by ETT + IPPV ,maintenance with O₂ and 1% halothane and at end of the procedure reversed with Neostigmine 2.5 mg + Atropine 1.2 mg. Additional drugs are :preinduction Cimetidine 200 mg I.V, and at recovery Diclofenac Sodium 75 mg I.M. Postoperatively all patients received the same treatment of: I.V Fluids ; Metronidazole 500 mg ; Tramadol 100 mg.

Monitoring for SPO₂ , NIBP , pulse rate , ECG , Capnography. Reverse Trendelenberg with right side up position was made and pneumoperitoneum was created at the supraumbilical port site, with the closed needle technique. During laparoscopy, intrabdominal pressure (IAP) was maintained at 10 – 12 mm Hg. The patients assessed at 4 hours interval postoperatively in each group for 24 hours except during sleep.

The nausea score was evaluated using a (0-10) numerical analogue scale [NAS]:(1-3) = mild, (4-7)=moderate,(8-10) =severe, where 0= no nausea and 10= nausea as bad as can be.

The severity of emetic episodes in terms of number of episodes per patient in each group was tabulated. The number of episodes per patient was classified as mild: < 2episodes, moderate = 2 episodes and severe > 2 episodes

Results were recorded in data collecting sheet .The difference was considered to be statistically significant if the P value was less than 0.05

RESULTS :

In this study, (100) patients admitted to the operating room for Laparoscopic cholecystectomy .

The weight distribution ranged from (60kg-100 kg), the sample difference incidence was not significant with any weight group as shown in figure (1), also weight parameters treated by the two different drugs was not significant.

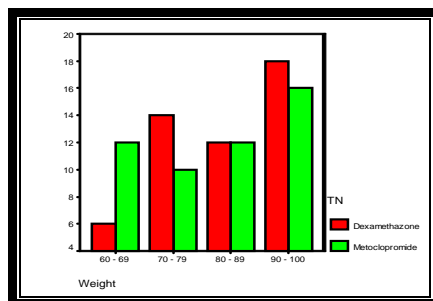


Figure 1: Cluster Bar chart for the distribution of Weight groups between the different two treated samples (Dexamethasone & Metoclopramide).

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The sample difference incidence was not significant between the two gender groups as shown in figure (2).

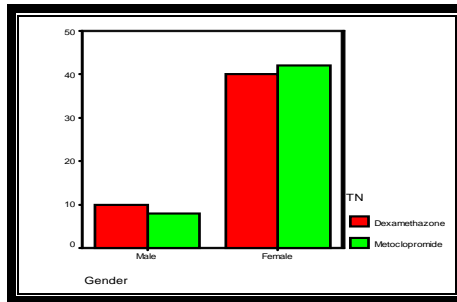


Figure 2: Cluster Bar chart for the distribution of Gender between the different two treated samples (Dexamethasone & Metoclopramide).

The age distribution ranged from (25-55) years (3), but age parameters treated by the two different drugs was highly significant as in table (1). The sample difference incidence was not significant with any age group as shown in figure (1).

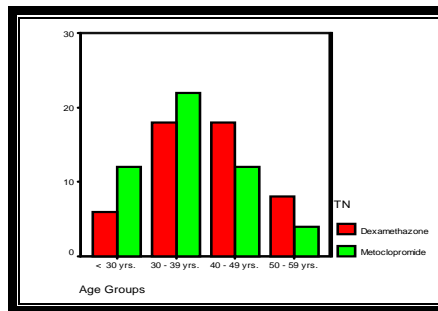


Figure 3: Cluster Bar chart for the distribution of Age groups between the different two treated samples (Dexamethasone & Metoclopramide).

Table 1: Summary statistics for weight and age parameters treated by the two different drugs.

P-value	SE	SD	Mean	Drugs	Parameters
>0.05 NS	1.71	12.12	81	Dexamethasone	Weight
	1.8	12.75	79.2	Metoclopramide	
<0.01 HS	1.25	8.85	40.16	Dexamethasone	Age
	1.19	8.44	35.36	Metoclopramide	

Table (2) shows the distribution of overall the studied periods in the two different treated samples with comparison significant regarding

Nausea. All periods are no significant except period 24 hr. of postoperative data collection.

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Table 2: Nausea (absent / present).

FEPT		Metoclopramide		Dexamethasone		Nausea censored Periods
C.S.	P-value	Present	absent	Present	absent	
NS	0.080	28	22	20	30	Post Operative
NS	0.151	22	28	16	34	4 hrs Period
NS	0.252	16	34	12	38	8 hrs Period
NS	0.227	12	38	8	42	12 hrs Period
NS	0.339	4	46	2	48	16 hrs Period
NS	0.134	6	44	2	48	20 hrs Period
S	0.028	5	45	0	50	24 hrs Period

S : Significant at $P_{-value} < 0.05$

Table (3) shows the distribution of vomiting overall the studied periods in the two different treated samples with comparison regarding Vomiting.

From postoperative period to 12hr, are no significant, while from 16 hr. to 24 hr. are significant.

Table 3: Vomiting (absent / present).

FEPT		Metoclopramide		Dexamethasone		Vomiting censored Periods
C.S.	P-value	Present	absent	Present	absent	
NS	0.074	23	27	15	35	Post Operative
NS	0.500	9	41	8	42	4 hrs Period
NS	0.500	6	44	5	45	8 hrs Period
NS	0.134	6	44	2	48	12 hrs Period
S	0.028	5	45	0	50	16 hrs Period
S	0.028	5	45	0	50	20 hrs Period
S	0.028	5	45	0	50	24 hrs Period

S : Significant at $P_{-value} < 0.05$

DISCUSSION:

PONV is still among the most common and troublesome complications of surgery, causing delay in patient discharge from hospital, especially in outpatient surgeries. Therefore, therapeutic strategies preventing this complication are of utmost importance⁽¹²⁾.

The first clinical trial to suggest that dexamethasone may prevent PONV was published in 1993⁽¹³⁾.

Dexamethasone was first reported to be an effective antiemetic agent in patients receiving cancer chemotherapy in 1981⁽¹⁴⁾.

The onset time of dexamethasone's anti-emetic effect is 2 h⁽¹⁵⁾, and the late (i.e. up to 24 h) efficacy seems to be more pronounced⁽¹⁶⁾.

The usefulness of Metoclopramide as an antiemetic agent during cancer chemotherapy is better documented than when it is used as the sole agent for prevention of PONV⁽¹⁷⁾.

In this study, there is a significant role of dexamethasone in PONV prevention in comparison to metoclopramide.

J. J. Wang et al found dexamethasone was effective in the prevention of nausea and vomiting after laparoscopic cholecystectomy⁽¹⁸⁾.

Liu and colleagues demonstrated that dexamethasone alone at doses of 5mg and 2.5 mg are as effective as 10 mg, in reducing the incidence of PONV.^(19,20)

Huang *et al.*, concluded in their study that the incidence of PONV was reduced by about 35% after pretreatment with a low dose of dexamethasone (5mg) in patients undergoing laparoscopy for tubal ligation⁽²¹⁾.

Ekmen N et al showed that PONV incidence was not significantly different between the dexamethasone and metoclopramide groups⁽²²⁾.

The difference between our results and theirs was probably due to diminished sample size.

M. Entezari et al. showed that although patients given metoclopramide or dexamethasone alone had a lower incidence of PONV, the effect was not statistically significant whereas their combined use had a significant effect^(23,24,25).

CONCLUSION:

A single dose of Dexamethasone is effective same as Metoclopramide in prevention of PONV, and it is better in late prevention postoperatively.

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