Comparing effectiveness of Metoclopramide alone versus its combination with Dexamethasone for prevention of postoperative nausea and vomiting after thyroidectomy at Menelik II Hospital, Addis Ababa, Ethiopia: a prospective cohort study

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Abstract

Background Postoperative nausea and vomiting (PONV) is a common post-operative unpleasant experience and also common following thyroidectomy that may cause for hematoma and post-operative airway obstruction. Several agents have been tried to reduce severity and incidence PONV. This study intended to compare effectiveness of Metoclopramide alone and its combination with Dexamethasone for prevention of PONV after thyroidectomy at Menelik II Hospital.

Methods Prospective cohort study was conducted on 76 American Society of Anesthesiologist (ASA) class I and II, adult patients undergone thyroidectomy. A systematic random sampling was applied to identify sample population through skip interval till required sample size was achieved. Study participants were grouped as Group = M (Metoclopramide alone) and Group = MD (Metoclopramide plus Dexamethasone). Following study participant received either 10 mg Metoclopramide or 5mg Metoclopramide plus 4mg Dexamethasone, PONV was recorded at 6, 12 and 24 hours post operatively. Continuous variables were expressed as mean $\pm$ SD or median-IQR as appropriate. Analysis was done by independent two sample t test, Mann Whitney U test and χ^2 or Fisher exact test. P-Value <0.05 was considered as statistically significant.

Results The overall incidence of PONV within the first 24 hours was significantly higher in Group M as compared to Group MD, 24(63.15%) versus 9 (23.68%) respectively with a P-value of $< .01$. Although difference was insignificant, severity of nausea at 6th, 12th and 24th was still higher in Group M. From side effects, Sedation was significantly lower in Group MD 6 (15.79%) versus 15 (39.47%) with a P-value of $< .05$. Despite difference was insignificant headache was found higher in Group M 10 (26.31) vs. 6 (10.52) respectively.

Conclusions 5mg Metoclopramide combined with 4mg Dexamethasone has significant effects for prophylaxis of post-operative nausea and vomiting after thyroidectomy. Some side effects of drugs were also significantly reduced in combination group.

Introduction

Postoperative nausea and vomiting, nausea and vomiting can be defined as the development of nausea and vomiting after surgical procedure but prior to hospital discharge, a subjective state of urge to vomit and forced ejection of gastric contents respectively(1).

Pre-operative factors like; being female, history of motion sickness, nonsmoking, Intraoperative factors like; duration of surgery and anesthesia and post-operative factors like; Pain, Opioids, Hypoglycemia, Hypoxemia, Oral intake have a role for PONV(2).

Despite modern anesthetic and surgical techniques, the incidence of PONV remains high which needs prevention and treatment before patients suffer from complications like severe dehydration, acid base

and electrolyte imbalance, aspiration pneumonia wound dehiscence, bleeding and fatal air way obstruction due to hematoma after thyroidectomy (3,4).

A number of agents have been tried to decrease the incidence and severity of PONV. Although, their cost is expensive, recently serotonin antagonist such as ondansetron is the most popular agent used for prevention and treatment of PONV. Other cost effective antiemetic such as Metoclopramide and Dexamethasone have also been shown to be an effective anti-emetic drug used for prevention of PONV in patients undergoing surgery(5). Even though the effective minimum safe dose has been controversial,a combination of metoclopramide and dexamethasone may have better antiemetic effect (6).

Among undesired effects of anesthesia PONV is the most common and patients have 10% risk of developing the problem(7). Post-operative nausea and vomiting after thyroidectomy is common, with the incidence rate of 60% to 84 % (8).

Following PONV the patient may face health related problems such as dehydration, electrolyte imbalance, wound dehiscence, and post-surgical hemorrhage, and also other time and cost related problems(3). After thyroid surgery PONV is a challenging problems for anesthetists due to surgical wound dehiscence and hematoma-induced upper airway obstruction following the procedure(9).

Several antiemetic have been studied for the prevention and treatment of PONV for patients scheduled for surgery. Among those antiemetic, Metoclopramide and Dexamethasone are one of them used for prophylaxis of PONV. However they have been reported to cause side effects such as excessive sedation, cardiac dysrhythmia and delayed wound healing, and wound infection, decreased serum cortisol levels, increased blood glucose levels (BGLs) respectively even after a single injection that may worsen by increased dose (10, 11). Using combination of low dose Metoclopramide with Dexamethasone may be better than a single high dose Metoclopramide alone or Dexamethasone for prevention of PONV(5, 6).

Despite the fact serotonin receptor antagonists are highly effective in the prevention and treatment of PONV compared to Metoclopramide and Dexamethasone, their usages are limited because of their high cost and unavailability specially in most governmental hospitals of developing countries (12).

Although Metoclopramide and Dexamethasone as higher dose are effective with low cost, there have been no published researches that indicate, whether the combination is effective or not for prophylaxis of PONV. Beside this, different studies reported as PONV could be influenced with various factors such as duration of surgery and anesthesia, types of surgery and anesthesia, analgesic drugs like opioids, heredities and ethnicity, this other country finding may not tailored with our populations. Therefore the finding of this study, along with improving the clinical practice, it become base line for further strong study like RCT. In the process this study were compared the incidence of PONV, severity of PONV and side effects of the drugs between the two groups.

Methods

Study design and setting:

Hospital based prospective cohort study was employed from December 1, 2017 to February 30, 2018 G.C at Menelik II Hospital. It is the earlier and historical public hospital found in a capital city of Ethiopia, Addis Ababa in Yeka kifle ketema. The hospital has been serving for about 1.6 million catchment populations, which provides all general, urological, gynecological, orthopedics and emergency surgeries services. Among the units found in the hospital, surgery department is a major unit which has three separated female and male wards in each referral clinics. And also the unit has three functional operating tables in the operation room and one PACU nearby the operation room. Despite having the evidence the hospital has been using Metoclopramide alone and Metoclopramide and Dexamethasone combination to prevent and treat PONV after thyroidectomy procedure. Therefore, providing evidence for better clinical practice is important after comparing the effectiveness of Metoclopramide alone versus combined with Dexamethasone for prevention of PONV after thyroidectomy in the Menelik II hospital.

Study participants:

All surgical patients who were scheduled for thyroidectomy under General Anesthesia at Menelik II hospital were source population. While Patients who were scheduled to undergo elective thyroidectomy and took either 10 mg IV Metoclopramide alone or 5 mg Metoclopramide plus 4mg Dexamethasone 10–20 minutes before induction of anesthesia were study population. In the study adult female patients who received, either 10 mg IV Metoclopramide alone or 5 mg Metoclopramide combined with 4 mg Dexamethasone as an anti-emetic prophylaxis 10–20

minutes before induction of anesthesia for elective thyroidectomy within the study period were included. While Patients who received other antiemetic prophylaxis before induction of anesthesia, Patients who received other Steroid, Patients who had motion sickness, Patients who took extra anti-emetics during intra-operative period, Patients who were induced with propofol, Patients with Post-operative hypotension, hypoxia and hypoglycemia were excluded.

Sample size determination:

The sample size was determined using two population proportion with equal sample size formula for independent cohort study

$$n_1 = [z_{\alpha/2}(1+h) \sqrt{p_1q_1(p_1-p_2)^2 + z_{\beta} p_1q_1 h + p_2q_2}]^2 (p_1-p_2)^2$$
 where p_1 and p_2 are the probability of postoperative nausea and vomiting from Metoclopramide alone and Metoclopramide plus Dexamethasone group respectively.

n_1 = sample for Metoclopramide, n_2 = sample for Metoclopramide plus dexamethasone. $n_2 = n_1$, = n_2/n_1 .

Previous study done in Pakistan in 2011 showed that 64% from Metoclopramide group and 26% from Metoclopramide plus Dexamethasone group complained of postoperative nausea and vomiting (5). $P1 = 0.64$ $q1 = 0.36$, $q\bar{\bar{}} \text{ (change)} = 1 - p\bar{\bar{}} = 0.55$, $P2 = 0.26$ $q2 = 0.74$ $p\bar{\bar{}} \text{ (change)} = (p1+p2)/1+ = 0.45$. Having plan to get 90% chance of power and then the sample size becomes $n1 = 34$ and $n2 = 34$ patient. By adding 10% contingency, a total of 76 patients were participated in this study.

Sampling technique:

A Systematic random sampling technique was applied to achieve the required sample size during the study period. From the situational analysis, at Menelik II hospital, on average two elective thyroidectomies were done in every working day. Therefore during the study period there were a total of 132 goiter patients. Anti-emetic prophylaxis provision in the study hospital has been varied from Anesthetist to Anesthetist depending in their experience. Some Anesthetists have provided 10 mg IV Metoclopramide alone while others have provided 5mg Metoclopramide with 4mg Dexamethasone 10–20 minutes before induction of anesthesia commonly by thiopental for patients who undergo elective thyroidectomy. Using this opportunity Patients who received 10 mg Metoclopramide alone were grouped as Group = M while patients who received 5 mg Metoclopramide with 4 mg Dexamethasone were grouped as Group MD. After considering this, by using the skip interval ($k = N/n$, $132/76 = 2$), where N = number of patients during the study period, n = sample size, k = interval. Since the interval value was 2 the first patient was selected using lottery method. Then the patients were taken at regular intervals down the list or every k^{th} study patients were chosen from the sampling frame for each group.

Data collection tools and technique:

Questionnaire and checklist was prepared in English language which contained about Post-operative nausea and vomiting (PONV), Side effects of Metoclopramide alone and Metoclopramide plus Dexamethasone, Socio demographic, Exposure (Metoclopramide alone, Metoclopramide plus Dexamethasone), Anesthesia and Surgery related variables. Initially trained nurse demonstrate the patients on how to report nausea and vomiting using the NRS score, then Patients were asked to report nausea and vomiting as soon as they fully respond to verbal command. In the meantime, PONV and other variables were recorded by one PACU and two ward nurses at 6th, 12th and 24th hours.

Data quality assurance:

Data collectors were trained about ethical issue and how to maintain data quality. A pre-test was done on 5% of the sample size outside study area at Zewditu Memorial hospital. During data collection, regular supervision and follow up was made. Also the completeness and consistency of data were checked daily.

Data Management and Analysis procedure:

The data were checked manually for completeness and entered in to EPI info version 7. Statistical package and then exported to SPSS version 20 computer program for analysis. To display the result, descriptive statistics were computed and summarized using tables and figures. Continuous variables age and body mass index were expressed as mean $\pm$ SD for normally distribute data, while duration of surgery, duration of anesthesia, NPO time, dose of Tramadol, Fentanyl and Diclofenac were expressed as median $\pm$ IQR for skewed data. Frequency and cross tabulation was conducted to describe relevant variables in relation to the outcome variables and after checking for the normality assumption, analysis was done by independent sample t test for comparing means of two independent samples of continuous variables (Age and BMI). Comparisons between different categories (incidence and severity of PONV and side effects of Metoclopramide alone and Metoclopramide with Dexamethasone) were evaluated using χ^2 and Fisher's exact test as appropriate. Non-normally distributed variables (duration of surgery and anesthesia, dose of analgesic) were analyzed using the Mann–Whitney *U*-test. P-value <0.05 was considered as statistically significant.

Operational Definitions:

- PONV: is occurrence of episodes of nausea and vomiting after a surgical procedure and before 24 hrs.
- Nausea: is abdominal discomfort an urge to vomit
- Vomiting: is a forced ejection of gastric content
- Grading of nausea by using VAS score
- 0 = No nausea
- 1–3 = Mild nausea.
- 4- 6 = Moderate nausea
- 7–10 = Severe nausea
- Grading of vomiting
- 0 = No Vomiting
- < 2 episode vomiting
- 2 episode vomiting
- 2 episode vomiting
- Duration of anesthesia time: is interval from loss of consciousness to spontaneous recovery of consciousness in minutes after surgical procedure.
- Duration of surgery time: is interval from skin incision to closure in minutes
- Numeric Rating Scale: is a valid pain intensity assessment tool that involves asking a patient to rate his or her pain from 0–10(11 point scale) with the understanding that 0 is equal to no pain and 10 equal to the worst possible pain
- Grading of post-operative pain by using numeric rating scale
- 0 = No pain

- 1–3 = Mild pain
- 4–6 = Moderate pain
- 7–10 = Severe pain
- NPO time: is from the last meal to time of induction of anesthesia in hours
- Hypotension: low blood pressure (systolic BP < 90mmhg), with 24 hours
- Hypoxia: is inadequate oxygen supply with saturation reading below 90% within 24 hours.
- Sedation: is a state between relaxed consciousness and very sleepy within 24 hours
- Headache: the symptom of pain anywhere in the region of head within 24 hours
- Anti-emetic request: if patients ask anti-emetic drugs any time within 24 hours post operatively when they feel nausea or vomiting.

Results

Socio-demographic and Perioperative Characteristics of study participants:

Seventy six ASA class I and II female adult goiter patients were included in the study based on whether they had received Metoclopramide alone and Metoclopramide with Dexamethasone as an anti-emetic prophylaxis 10–20 minute before induction of anesthesia for prevention of PONV. Since the problem goiter is sex related the entire Study participants were females and there was no significant difference between the two groups regarding age, ASA class, BMI, and NPO time (Table 1).

Intraoperative and Postoperative characteristics of study participants:

The current study also revealed that there was no significant difference between the two groups regarding both intra operative and post-operative analgesia taken, and severity of post-operative pain, and duration of surgery and anesthesia (Table 2).

Incidence of PONV during the first 24 hours of post-operative period:

Post-operative nausea, vomiting and PONV were taken at 6th, 12th and 24th hours post operatively. The result showed, Post-operative nausea and vomiting were lower in the Group MD and significantly different at 6th hours of post-operative period (Table 3).

Overall incidence of PONV during the first 24 hours of post-operative period:

The overall incidence of PONVIN in the first 24 hours was significantly lower in Group MD with a p-value of <.01(Figure 1).

Severity of post-operative nausea and vomiting at Menelik II hospital:

The severity of post-operative nausea was lower in the MD group although there was no significant difference at all time interval of first 24 hours of post-operative period. There was no study participant patients had more than one episodes of vomiting during the first 24 hours of post-operative period (Table 4).

Side effects of Group M and Group MD at Menelik II hospital:

The frequent side effects reported in the current study were headache and sedation. On comparison sedation is found significantly higher in Group M with p-value of .03. Regarding to headache there was no significant difference between the two groups with p-value of .23

Discussion

In our study the demographic status and peri-operative data including post-operative analgesia were comparable between the two groups. From the study participants all patients were female might be due to the highest incidence of goiter in females. Therefore the difference of outcome between the two groups to be expected will be caused by success of drugs investigated for prevention of PONV.

Metoclopramide is a central dopaminergic D2 receptor antagonist and prokinetic drug that increases gastric emptying and shortens bowel transit time and well known as sole anti-emetic agents for prevention and treatment of PONV (16). Dexamethasone has been used as an antiemetic with some degree of side effects and could decrease PONV when it combined with Metoclopramide and others anti-emetics. Mechanism of antiemetic effects of Dexamethasone is unclear till yet but it may involve central inhibition of prostaglandin and reduces 5-hydroxytryptophan in the neural tissue(13).

In this study it is found that the overall incidence of PONV was significantly higher in Group M as compared to Group MD 24 (63.15%) versus 9 (23.68 %) respectively with a p-value of <.01. The current study result was consistent with study done in Pakistan (5) demonstrated that PONV was higher in Metoclopramide alone group as compared to Metoclopramide plus Dexamethasone group, 31 (62%) versus 13 (26%) respectively with a P-value of <.0.05. Another study in Croatia (15) also demonstrated that PONV also higher in Metoclopramide alone group as compare to Metoclopramide plus Dexamethasone group, 18 (45%) versus 5 (13%) respectively with a p value of <0.05.

Our study revealed that the incidence of PONV was significantly lower in Group MD in comparison to Group M 4 (10.52 %) versus 15 (39.47%) respectively with a p-value of <0.05) at 6th hours post-operative period. Our finding was in line with previous study done in Thailand (6) which demonstrated that the incidence of PONV was 9 (18%) in combined group and 22 (44%) in Metoclopramide alone group at 6th hours with p-value of < 0.01. In our current study PONV was lower at 12th and 24th post-operative period

and the difference was not significant with P- value of $>.05$. The current result was contradicted with previous study demonstrated that PONV was 10 (20%) versus 26 (52 %) at 12th hours and 0 (0%) versus 14 (28 %) at 24th hours respectively with significant difference with p-value of $<.05$. The reason of variation of these result might be due to the time of drugs administration in our study the anti-emetic drugs was given 10–20 min before induction of anesthesia preoperatively while in previous study the drug was given just before end of anesthesia intra operatively. Types of procedure might be the reason as in our study after thyroidectomy while in previous study after laparoscopic cholecystectomy. In addition to those above reasons population difference and anesthesia practice may have a role for such difference.

We also found that severity of nausea at 6th, 12th and 24th were higher in Group M even though the difference was not significant with p–value of $>.05$. In contrary to the current finding, study done in Palestine (17) demonstrate that severity of nausea was lower in combination group as compared with Metoclopramide alone group with p-value of 0.01 regarding intensity of nausea. The likely reason for this alteration might be because of dose and time of drug administration, types of procedure, population variation and anesthesia practice.

The improvement of prevention of PONV in a combination groups can be clarified by the fact that Dexamethasone itself is an antiemetic drug that act via different mechanism in preventing PONV. Mechanism of antiemetic action of Dexamethasone is may be involved in central inhibition of prostaglandin and could reduce the level of 5- hydroxytryptophan in neural tissue by depleting its precursor tryptophan (14). So that diverse mechanisms working at the same time in a combination group for PONV may be responsible for this superior results.

The predominant side effects reported in our study were headache and sedation. Among those side effects sedation was found significantly higher in Group M, 15(39.47) versus 6(15.79) respectively with p-value of $<.05$. The higher score of sedation might be triggered by increase dose and additive interaction with other sedative agents such as opioids and induction agent that administered during surgery. This finding was in line with study done in Thailand (6) as sedation was 29 (58% in metoclopramide alone versus 9 (18%) in combination group with p value of <0.01 .

In contrary to the our study another study done in Croatia demonstrated that sedation was 3 (8%) and 3 (8%) in both group respectively demonstrated difference was not significant (15). The reason for this difference might be due to variation in population, trends of pain management (opioids) and anesthesia practice.

The finding of this study also showed that headache was higher in Group M, 10 (26.31) versus 6 (10.52). However the difference between two groups was not significant with p-value of $>.05$. The current study was in line with study done in Palestine (17) demonstrate that headache was 9 (30%) versus 9 (30%) with p of value of $>.05$ which was not significant difference.

On comparison of anti-emetic request, in the present study only two patients of Group MD asked antiemetic as compared to seven patients in Group M with a p-value of $>.05$. This result was contradicted with study done in Croatia (15) (23) demonstrated that four patients from the Metoclopramide alone group and none of the patients from the Metoclopramide plus Dexamethasone group required antiemetic request with p-value of <0.05 which was significant. The possible reason could be due to lack of similar standard for provision of anti-emetic medication once the patients complain nausea and vomiting, and request anti-emetics. As limitation the study design was observational that made difficult to set standard for intervention. In addition to this the definition of nausea may be different among study participants this was solved by initially explaining about nausea symptom. This study finding generalized only for adult female patients who took thyroidectomy under General Anesthesia.

Conclusion

The result of our study demonstrate intravenous injection of 5mg Metoclopramide combined with 4mg Dexamethasone is effective and safe for anti-emetic prophylaxis of PONV than 10mg Metoclopramide alone after thyroidectomy.

We recommend that better to provide 5mg IV Metoclopramide with 4mg Dexamethasone 10–20 minute before induction of anesthesia for prevention of PONV after thyroidectomy.

We recommend that Anesthetists and other health professionals better to use 5mg Metoclopramide with 4mg Dexamethasone for prevention of PONV after thyroidectomy.

We also recommend additional more strong study such as randomized controlled study.

Declarations

ASA: American Association of Anesthesiologist; BGL: Blood glucose levels; BMI: Body mass index; BP: Blood pressure; CI: Confidence interval; EAA: Ethiopian Anesthetists Association; GA: General Anesthesia; IQR: Inter quartile range; IRB: Institutional Review Board; IV: Intravenous; NPO: None Per-Ose; NRS: Numerical rating scale; PACU: Post anesthesia care unite; PONV: Postoperative Nausea and Vomiting; RCT: Randomized Control Trial; SD: Standard deviation; UK: United Kingdom.

Declarations:

Ethics approval and consent to participate:

Before conducting the study, ethical approval and clearance were obtained from Addis Ababa University ethical review committee with the reference number 99/2010, December 11/2016. Then formal letter detailing the objective of study was given to the hospital administrators. Following permission was gotten from the hospital managers; data collectors took informed written consent from each study

participant to gather data. During data collection process norms, values and morals of patients were respected by all data collectors and no financial compensation or provision was made.

Consent for publication:

Not applicable.

Availability of data and materials:

The datasets used and/or analysed during this study are available from the corresponding author and provided on a reasonable request.

Competing interests:

All authors declare that they have no competing interests.

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Authors' contributions:

TT, AA and TB were involved in the conception, design, analysis, interpretation, report and manuscript writing. All authors read and approved the final manuscript.

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Tables

Table 1: Characteristics of study participants t-test and chi-square output in Menelik II hospital, Addis Ababa, Ethiopia.

	Group M (n=38)Group MD (n=38)		P-value
Age in year (Mean± SD)	40.47±10.205	37.74± 8.847	0.17
ASA class			
I (%)	32 (84.21)	29 (76.32)	0.38
II (%)	6 (15.79)	9 (23.68)	
BMI in kg/m ² (Mean ±SD)	22.0341 ±1.921	21.8432 ±1.734	0.26
NPO time in hours (IQR)	10 (10-11)	10 (9.75-11)	0.66

N(%)=number(percent), BMI = body mass index, NPO= None Per-Ose = Mean ±SD= mean and standard deviation, Group M= metoclopramide alone, Group MD= Metoclopramide plus Dexamethasone, IQR= interquartile range, kg/m² = kilogram per meter square

Table 2: Man Whitney U test and chi-square output of intraoperative and postoperative characteristics in Menelik II hospital, Addis Ababa, Ethiopia

	Group M (n=38)	Group MD (n=38)	P-value
Induction agent; Thiopental mg (median, IQR)	300 (250-350)	300 (250-350)	.16
Halothane (%)	22 (57.89)	26 (68.42)	
Isoflorane (%)	16 (42.11)	12 (31.58)	.342
Intraoperative Tramadol mg(IQR)	100 (50-100)	100 (50-100)	.50
Intraoperative Fentanyl µm(IQR)	25 (0-50)	25 (0-25)	.35
Intraoperative Diclofenac mg(IQR)	75 (56.25-75)	75 (0-75)	.45
Surgical time in minutes(IQR)	75 (60-91.25)	73 (65-90)	.95
Anesthesia time in minute (IQR)	85 (73.75-110)	86 (77.25-101.25)	.90
Post-operative Tramadol mg(IQR)	50 (0-100)	50 (0-75)	.33
Post-operative Diclofenac mg(IQR)	75 (0-75)	75 (0-75)	.86
Post-operative pain			
Mild	16 (42.1)	11(28.94)	
Moderate	8 (21.05)	5 (13.16)	.19

N (%) = number (percent), Mean $\pm$ SD= mean and standard deviation, Group M= metoclopramide alone, Group MD= metoclopramide plus Dexamethasone, IQR= interquartile range, mg= milligram, µm= microgram,

Table 3: Incidence of PONV chi-square output during the first 24 hours of post operatively in Menelik II hospital, Addis Ababa, Ethiopia

	Group M	Group MD	P-value
Hours	(n=38)	(n=38)	
0-6hr			
Nausea	11(28.94)	4 (10.52)	.044*
Vomiting	4 (10.52)	0 (0)	.042*
PONV	15 (39.47)	4 (10.52)	.004*
7-12hr			
Nausea	7 (18.42)	5 (13.15)	.529
Vomiting	3 (7.89)	2 (5.26)	.644
PONV	10 (26.31)	7 (18.42)	.409
13-24hr			
Nausea	2 (5.26)	1(2.63)	.78
Vomiting	1 (2.63)	1(2.63)	1
PONV	3 (7.89)	2 (5.26)	.644
Overall PONV	24 (63.15)	9 (23.68)	.001*

N (%) = number (percent), Group M=Metoclopramide alone, Group MD= Metoclopramide plus Dexamethasone, PONV= post-operative nausea and vomiting, *= statistical significant

Table 4: Severity of postoperative nausea and anti-emetic request in Menelik II hospital, Addis Ababa, Ethiopia

Hours	Group M (n=38)	Group MD (n=38)	P-value
0-6hr			
Mild (%)	2 (5.26)	1 (2.63)	.285
Moderate (%)	5 (13.15)	2 (5.26)	
Severe (%)	4 (10.52)	1 (2.63)	
7-12hrs			
Mild (%)	3 (7.89)	1(2.63)	.843
Moderate (%)	1(2.63)	1(2.63)	
Severe (%)	3 (7.89)	3(7.89)	
13-24hrs			
Mild (%)	0 (0)	1(2.63)	1
Moderate (%)	1(2.63)	0 (0)	
Severe (%)	1(2.63)	1(2.63)	
Anti-emetic request at 24 hours (%)	7(10.52)	2 (2.63)	.15

N (%) = number(percent), Group M=Metoclopramide alone, Group MD= Metoclopramide plus Dexamethasone

Figures

Figure 1

Overall incidence of PONV during the first 24 hours in Menelik II hospital, Addis Ababa, Ethiopia.