

# PONV-A COMPARATIVE STUDY OF METOCLOPRAMIDE ALONE AND WITH DEXAMETHASONE IN STRABISMUS SURGERY

Dr M Shafique Tahir \*, Dr M Yousaf Bandesha \*\*, Dr Aftab Haider \*,  
Dr Muhammad Masood \*, Dr Salman Waris \*\*\*

---

## ABSTRACT

**Objective:** To determine the efficacy of intravenous metoclopramide alone and in combination with dexamethasone in preventing postoperative nausea and vomiting (PONV) in patients undergoing strabismus surgery.

**Study Design:** Single blinded, randomized, interventional study.

**Place and Duration of Study:** This study was conducted in the department of Anaesthesiology at Nishtar Hospital, Multan from October 2005 to October 2006.

**Patients and Methods:** After the approval of the hospital's ethical committee, the study was conducted on 60 patients who were randomly divided into two groups, each group containing 30 patients. All of the patients were between 2-14 years of age and were A.S.A-I. Randomization was done by envelope draw method. The patients received either metoclopramide 150 µg/kg or dexamethasone 150 µg/kg with metoclopramide 150 µg/kg combination IV, 30 minutes before the induction of anesthesia. General anesthesia was induced with thiopentone sodium, nalbuphine, succinylcholine and maintained with isoflurane and N<sub>2</sub>O + O<sub>2</sub> in both groups. PONV were evaluated postoperatively.

**Results:** Patients in group II who received metoclopramide plus dexamethasone experienced significantly less PONV during the first 24 h after surgery.

**Conclusion:** In this study, a single dose of metoclopramide plus dexamethasone (150 µg/kg of each drug) produced better antiemetic effects after strabismus surgery than metoclopramide alone.

**KEYWORDS:** PONV, dexamethasone, metoclopramide, strabismus surgery.

---

\*\* Assistant Professor

\*\*\* Professor and Head of Department

\* Department of Anaesthesiology Nishtar Hospital Multan.

### For correspondence:

Dr Salman Waris, MBBS, DA, MCPS, FCPS

Professor and Head, Department of Anaesthesiology,

Intensive Care Unit & Pain Clinic,

Nishtar Medical Institution Multan

E-mail: salmanwariss@hotmail.com

## INTRODUCTION

Postoperative nausea and vomiting (PONV) is among the most unpleasant experiences associated with anaesthesia and surgery.<sup>1,2</sup> Popularly referred to as the "Big Little Problem", PONV complication ranges from mild discomfort to frank vomiting leading to aspiration of gastric contents and death. Per-

sistent nausea and vomiting can lead to dehydration and nutrition problem. Extremely forceful vomiting may also leads to the wound rupture and rupture of esophagus. There are certain factors that can predispose the patients to PONV. These include young age, female gender, obesity, prolonged fasting, recent food intake, history of previous nausea and vomiting, history of motion sickness, long duration and depth of anaesthesia, CO<sub>2</sub> retention, rough handling, and the type of surgical procedure.<sup>3,4</sup> Patients having strabismus surgery, who are not given prophylaxis, are frequently exposed to increased risk (40-85%) of post-operative nausea and vomiting.<sup>5</sup> The risk factors are intraoperative use of volatile anaesthetic,<sup>6</sup> opioids<sup>7</sup> and postoperative pain.<sup>8</sup> A number of agents have been tried to decrease the incidence of PONV. Currently, 5HT<sub>3</sub> antagonist such as ondansetron and granisetron are the most popular. However, their cost becomes one of the drawbacks especialy in public sector hospitals. Some cost effective antiemetics like metoclopramide have also been shown to be effective and safe drug for both prevention and treatment of post-operative nausea and vomiting.<sup>9</sup> Although this drug is effective in reducing nausea, and vomiting, it has side effects of its own, including acute dystonia, parkinsonism, malignant neuroleptic syndrome and catatonia in some patients.<sup>10</sup> Therefore it is advisable to find a method for using a smaller dose which would not induce such complications. Dexamethasone has been used as an antiemetic for more than 20 years in patients undergoing chemotherapy with limited side effects. Dexamethasone in a dose of 8-10 mg can prevent PONV after various surgical procedures associated with high incidence of PONV.<sup>11</sup> Further, the antiemetic effect of dexamethasone is reported to be equal to or better than 5HT<sub>3</sub> receptor antagonists. The exact mechanism of preventing PONV by dexamethasone is not known but probably prostaglandin antagonism<sup>12</sup>, serotonin inhibition in gut<sup>13</sup>, release of endorphins<sup>14</sup> and its anti-inflammatory membrane stabilizing effect may be the cause of its antiemetic effect.<sup>15</sup> A single dose of dexamethasone has been considered to be safe.<sup>16</sup> Strabismus corrections are being widely performed at

Nishtar Hospital, Multan. However, there is no local study that documents the effectiveness of dexamethasone in prevention of PONV. This study was designed in pediatric patients undergoing strabismus surgery to compare the efficacy of preoperative administration of metoclopramide plus dexamethasone for lowering the incidence and severity of PONV in reduced dosage.

## PATIENTS AND METHODS

This study was conducted in the Department of Anaesthesiology Nishtar Hospital, Multan from October 2005 to October 2006. It was a prospective, single blinded, randomized, interventional study.

Written informed parental consent was obtained in all cases. 60 children, 2-14 years of age, ASA physical status I, who were scheduled for ambulatory strabismus surgery, were enrolled in the study. Children who received antiemetics, steroids or had a preoperative history of motion sickness were excluded. The patients were divided randomly into two groups to receive metoclopramide 150 µg/kg alone or dexamethasone plus metoclopramide (150 µg/kg of each drug) in a double blind fashion from coded syringes of 3 ml IV, 30 minutes before the induction of anesthesia. After establishing standard monitoring, general anesthesia was induced with nalbuphine 0.1 mg/kg, thiopental Na 6 mg/kg and succinylcholine 2 mg/kg and maintained with 50% N<sub>2</sub>O in oxygen and 1 MAC of Isoflourane. Muscle relaxation was obtained using atracurium. No other intraoperative and post-operative drugs were permitted. Patients were visited 1, 2, 4, 6, 12, 18 and 24 hours after operation by one of the investigators blinded for the type of intervention for data collection, any episode of PONV during the preceding period was noted. The data were analyzed by using students' t-test for parametric data and the Mann Whitney U-test or 2 tests for non-parametric data, with a p value < 0.05 regarded as significant.

## RESULTS

There were no significant differences between the two groups with respect to age and gender distribution. (Table 1)

**Table 1: Demographic data**

	Group I Metoclopramide (n= 30)	Group II Metoclopramide + Dexamethasone (n= 30)
Age	7 + 2.2 years	7.5 + 2.4 years
Gender		
Male	18	19
Female	12	11

n = No. of patients

PONV = Post operative nausea and vomiting

In the first 6 hours of postoperative observation period, significantly less PONV occurred in the metoclopramide plus dexamethasone group. Only 3 (10%) patients experienced any nausea or vomiting in group II (metoclopramide plus dexamethasone), versus 10 (30 %) in metoclopramide group. In next post operative period again the incidence of PONV remained less in metoclopramide plus dexamethasone group in 2 (6.6%) in Group-II vs. 3 (10%) in Group-I (p0.046). In initial 24 hours post operative period the incidence of PONV was significantly less. Only 7 (23.3%) patients experienced any nausea or vomiting in group II (metoclopramide plus dexamethasone), versus 17 (56.7%) in metoclopramide group. (Table 2)

**Table 2: Incidence of PONV**

		Group I Metoclopramide (n= 30)	Group II Metoclopramide + Dexamethasone (n= 30)	P-Value
PONV	0-6 Hours	10 (33%)	3 (10%)	0.037
	7-12 Hours	3 (10%)	2 (6.6%)	0.046
	13-24 Hours	4 (13.3%)	2(23.3%)	< 0.001
Total PONV		17 (56.7%)	7 (23.3%)	

n = No. of patients

PONV = Post operative nausea and vomiting

## DISCUSSION

Patients undergoing ambulatory anesthesia for strabismus surgery are at high risk of developing PONV. To minimize PONV anesthesiologists have focused primarily on anesthetic techniques with minimal emetic potential and on the administration of different antiemetic drugs or combination of these<sup>17-18</sup>. We did not find any reports about using the combination of metoclopramide and dexamethasone versus dexamethasone or metoclopramide on the incidence of vomiting after strabismus surgery in children. In a prospective, randomized, double-blind study Pappas et al.<sup>19</sup> found that dexamethasone had significantly decreased the incidence of PONV in the 24 hours after discharge in children undergoing adenotonsillectomy. In a similar investigation Liu et al.<sup>20</sup> too, found that dexamethasone was effective in reducing the overall incidence of vomiting from 63.3% to 20% (p < 0.01). On the other hand Splinter et al.<sup>21</sup> had reported that low dose ondansetron with dexamethasone more effectively decreased vomiting after strabismus surgery in children than high dose ondansetron alone. Whiles Goedhals et al.<sup>22</sup> had reported that granisetron plus dexamethasone did not appear to confer an additional benefit over use of dexamethasone alone in controlling delayed nausea and vomiting following cisplatin chemotherapy. PONV is a multifactorial problem and several anesthetic and non-anesthetic factors must be standardized to examine the antiemetic potential of any specific drug. In the present study, the anesthetic technique, amount of IV hydration, narcotic analgesic dose and antiemetic therapy were standardized. Data from the present study indicate that in children undergoing ambulatory strabismus surgery, a single combination dose of IV dexamethasone plus metoclopramide (150 mg/kg of each drug) 30 minutes before the induction of anesthesia decreased PONV during the first 24 hours period after operation. Complications from corticosteroid therapy are typically related to its long term use and risks of steroid therapy of less than 24 hours duration are negligible.<sup>23</sup>

## CONCLUSION

In conclusion, a single dose of metoclopramide plus dexamethasone (150  $\mu\text{g}/\text{kg}$  of each drug) produces better antiemetic effects after strabismus surgery than metoclopramide alone and may be used without fear of untoward side effects.

## REFERENCES

1. Richard R. Outpatients anesthesia. 3rd edition, Philadelphia: Sanders Co; 1997. p 125
2. Atkinson R, Roshman G, Lee A. Synopsis of anesthesia. Oright busob, 1999.
3. Kaplan H, Apock B. Clinical psychiatry. Philadelphia: 1996. p 284-8
4. Mekenzie R, Tontisiara B, Karambelkar DJ. Comparison of ondansetron with ondansetron plus dexamethasone in prevention of postoperative nausea and vomiting. *Anesth Analg*, 1994; 79:961-4
5. Splinter WM, Rhine EJ. Low dose ondansetron with dexamethasone more effectively decreases vomiting after strabismus surgery in children than high dose ondansetron. *Anesthesiology* 1998; 88:72-5
6. Yoshitaka F, Tanata H, Toyooka HO. The effect of dexamethasone on antiemetic drugs in female. *Anesth Analg* 1997; 85:913-7.
7. Liu K, Chia Y. Effect of dexamethasone on postoperative emesis and pain. *Br J Anesth* 1998; 80:83-6
8. Italian G. Ondansetron plus dexamethasone vs metoclopramide plus dexamethasone in prevention of emesis. *Lancet* 1992; 11:96-9
9. Aydiner A, Onat H, Öztürk N. The efficacy of a five drug antiemetic combination. *J Pain Symptom Manage* 1993; 8:126-31
10. Poka R, Hernadi Z, Lamp L. Comparison of four antiemetic regiments. *Int J Clin Gynecol Obstet* 1998; 42:19-24
11. Pappas AL, Sukhani R, Hotaling AJ. The effect of preoperative dexamethasone on the immediate and delayed postoperative morbidity in children undergoing adenotonsillectomy. *Anesth Analg* 1998; 87:57-61
12. Italian G. Double blind dose finding study of four intravenous dose of dexamethasone in the prevention of emesis. *J Clin Oncol* 1998; 16:2937-42
13. Rothenberg DM, Peng CC, Normoyle DA. Nausea and vomiting after dexamethasone versus droperidol following out patient laparoscopy. *Acta Anesthesiol Scand* 1998; 42:637-42
14. Roila F, Bracarda S. Antiemetic activity of two doses of metoclopramide. *Am J Clin Oncol* 1998; 15:112-4
15. Goedhals L, Heron JF, Pagani O. Control of delayed nausea and vomiting with granisetron plus dexamethasone. *Ann Oncol* 1998; 9:661-6
16. Roila F, Sassi M. Double blind crossover trial of single vs divided dose of metoclopramide. *Eur J Cancer* 1997; 27:119-21
17. Aydiner A, Onat H, Öztürk N. The efficacy of a five drug antiemetic combination. *J Pain Symptom Manage* 1993; 8:126-31
18. Poka R, Hernadi Z, Lamp L. Comparison of four antiemetic regiments. *Int J Clin Gynecol Obstet* 1998; 42:19-24
19. Pappas AL, Sukhani R, Hotaling AJ. The effect of preoperative dexamethasone on the immediate and delayed postoperative morbidity in children undergoing adenotonsillectomy. *Anesth Analg* 1998; 87:57-61
20. Liu K, Chia Y. Effect of dexamethasone on postoperative emesis and pain. *Br J Anesth* 1998; 80:83-6
21. Splinter WM, Rhine EJ. Low dose ondansetron with dexamethasone more effectively decreases vomiting after strabismus surgery in children than high dose

- ondansetron. *Anesthesiology* 1998; 88:72-5 23
22. Goedhals L, Heron JF, Pagani O. Control of delayed nausea and vomiting with granisetron plus dexamethasone. *Ann Oncol* 1998; 9:661-6
- Henzi I, Walder B, Tramer MR. Dexamethasone for prevention of postoperative nausea and vomiting: a quantitative systemic review. *Anesth Analg* 2000; 90:186-94.



## **COMPREHENSIVE PAIN SERVICE**

at

**ISLAMABAD**

- Acute Pain Service
- Chronic Pain Service
- Cancer Pain Initiative
- Painless Labour
- Home Pain Service
- Pain Outreach Program

### **COL TARIQ'S PAIN SERVICE**

Islamic International Medical Complex, 7th Avenue, G-7/4, Islamabad.

Tel: 0321-5149709 Email: tariqhayatkhan@hotmail.com