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DEXAMETHASONE - A PROPHYLACTIC ANTIEMETIC

Anaesthesiology

Dr. Nikita Baser Assistant Professor, Anaesthesia, PMCH Udaipur.

Dr. Rekha Bayer Assistant Professor, Anaesthesia GMERS Medical College Himmatnagar Gujarat.

Dr. Mohit Birla Senior Resident, General Surgery, PMCH Udaipur.

Dr. Monika Meena* Senior Resident , Anaesthesia PMCH Udaipur. *Corresponding Author

ABSTRACT

Background: PONV is defined as nausea or vomiting occurs within 24 hours of surgery .PONV considerably increases health care costs due to delayed discharge from the recovery room, unanticipated hospital admission and greater demands of time and resources of the post care staff. **Materials and methods:** After approval from institutional ethical committee and written, informed consent from the patients, this prospective randomized study was conducted on 100 ASA grade I and II patients, aged 18-60 years scheduled for general anaesthesia. The patients were divided into two groups (50 patients each). Group N received normal saline 2m , and group D received Dexamethasone 2 ml (8 mg) The drug was administered according to allocated group along with preanesthetic medication. Standard general anesthesia technique was used in both groups. The incidence of nausea and vomiting was noted in both groups during the period of 0-8 hours, 8-16 hours and 16-24 hours postoperatively. **Results:** Incidence of post operative nausea was less in group D as compared to group N in duration of 0-8 hours (P=0.018), this is statistical significant .PONV in 8- 16 hours (P=0.395), 16-24 hours (P=0.129) was not statistical significant. Rescue anti emetic required was less in group D as compare to group N (P=0.044). **Conclusion:** Preoperative administration of dexamethasone was more effective than in prevention of postoperative nausea and vomiting without any apparent side effects.

KEYWORDS

Dexamethasone, Postoperative Nausea Vomiting.

INTRODUCTION

Postoperative nausea and vomiting (PONV) is most frequent and most unpleasant adverse outcome of surgery and general anesthesia. . PONV is defined as nausea or vomiting occurs within 24 hours of surgery[1]. Risk factor for ponv includes young age, female gender,obesity, non smoking status, history of motion sickness and history of PONV, use of inhalational anaesthetic agents and nitrous oxide, long duration of anaesthesia, perioperative use of opioids and few specific types of surgery (open gastrointestinal surgery, major gynaecologic surgery, laparoscopic surgery, breast surgery, craniotomy, eye and otorhinolaryngologic surgery)[1,2] Moreover, from the patient's point of view the anesthetist is clearly responsible for this "big little problems" of the early postoperative period[3].Complications associated with PONV may include dehydration, electrolyte imbalance, tension on suture line, venous hypertension, increased bleeding under skin flaps and can expose the subject to an increased risk of pulmonary aspiration of vomitus, if airway reflexes are depressed from the residual effects of anaesthesia[1,2]. PONV considerably increases health care costs due to delayed discharge from the recovery room, unanticipated hospital admission and greater demands of time and resources of the post care staff .The general incidence of nausea and vomiting 50% and 30% respectively, in high risk patient, the PONV rate can be as high as 80%4[1,4,5].

Dexamethasone is an inexpensive and effective antiemetic drug, with minimal adverse effects after a single-dose administration. The exact mechanism of antiemetic action of dexamethasone is not fully understood. There have been several suggestions, such as central or peripheral inhibition of the production or secretion of serotonin, central inhibition of the synthesis of prostaglandins, or changes in the permeability of the blood-brain barrier to serum proteins.[6,7].

For PONV prophylaxis, the efficacy of dexamethasone 4 mg IV is similar to ondansetron 4 mg IV. More recent studies increasingly use the higher dose of dexamethasone 8 mg IV than the minimum effective dose of 4 to 5 mg IV. So we decided 8mg dexamethasone as a prophylactic antiemetic in our study.

AIMS AND OBJECTIVE

1) To compare the efficacy dexamethasone for prevention of PONV
2) To determine drug related adverse effects.

MATERIAL AND METHODS

After approval from the institutional ethical committee and written and well informed consent from patient and their relatives the present study was performed in our institute.

Preanaesthetic evaluation was done as a institutional protocol. Patients aged between18-60 years ASA I-II, Scheduled for elective surgery requiring general anesthesia were included in this study.

Pregnant and lactating females, and asa grade III and IV,cancer patient , Patients who have history of any vomiting, retching, or nausea in the 24 hours preceding the administration of anaesthesia. Patients who have current history of alcohol abuse or drug abuse or taking any hormonal supplement, Patients required any opioid analgesic for post operative pain relief during the period of study were excluded in this study.

Sample size:

Based on previous studies by we estimated that a reduction in the incidence of PONV by 30% in an intervention arm over the control group would the clinically significant .For the study to have a power of 80% with a α error of<0.05, we need to have 48 patients in each group. To compensate the dropouts, we decided to include 50 patients in each group.

Our study is a prospective, randomized, and controlled study. Patients were randomly divided into 2groups by using a computer generated randomization.

Group D: Patient received dexamethasone (8mg) or 2ml in pre-anesthetic medication as an antiemetic.

Group N: Patient received normal saline 2ml in pre-anesthetic medication.

Preoperative preparation-procedure was explained to patients with written informed consent and patient was kept nil per orally (NPO) from mid night. In the operating room, Standard monitors (ECG, SPO_2 and NIBP) were applied. Patient was pre-medicated with inj. glycopyrrolate (0.2 mg), inj. midazolam (20mcg/kg) and inj. fentanyl (2µg/kg), and inj. dexamethasone 2ml (8mg) in group D and normal saline 2ml in group N before induction.

Pre-oxygenation was done for 3 minutes, anesthesia was induced with propofol (2mg /kg) and tracheal intubation was achieved with suxamethonium (1.5 -2 mg/kg). Intra-operative muscle relaxation was achieved with atracurium loading dose (0.5mg/kg) and maintained with (0.1 mg/kg)iv. Mechanical ventilation was provided with oxygen

and air mixture. Anesthesia was maintained for both groups by using total intravenous anesthesia method through propofol infusion (50-200mcg/kg/min). Nitrous oxide and inhalational anesthetic agent was avoided during anesthesia. Anesthesia was discontinued and residual neuromuscular blockage was antagonized by giving neostigmine (0.05 mg/kg) mixed with glycopyrrolate (0.01mg/kg). Patient was extubated and shifted to ward.

OBSERVATIONS

Data were collected.(age, sex, weight, and ASA grade, duration of anesthesia and surgery). Monitoring of haemodynamic parameters(heart rate, Mean BP and Oxygen Saturation) was done throughout the procedure and were recorded at following points: Preoperative in operation theatre or before intubation, After intubation, After extubation .

The incidence of nausea and vomiting was noted during following time period 0-8 hours, 8-16 hours and 16-24 hours. The intensity of nausea and vomiting was evaluated through the Bellville scoring scale (lack of nausea and vomiting=0, nausea=1, nausea with retching=2 and vomiting=3).

1) Nausea is defined as a subjectively unpleasant sensation associated with awareness of the urge to vomit[8].
2) Retching is defined as a labored rhythmic contraction of the respiratory muscles without the explusion of gastric contents[8].
3) Vomiting is defined as a forceful expulsion of gastric content from mouth[8].

Each episode of nausea was treated conservatively and no antiemetic medication was given to these patients. Each emetic episode was treated with oxygen inhalation with Hudson mask, intravenous fluid and inj. Metoclopramide 10 mg as rescue antiemetic.

RESULTS

Demographically data's were comparable (P>0.05) in between groups. Duration of surgery, duration of anaesthesia and haemodynamic parameters (pulse rate, mean arterial pressure,spo2 were also comparable.(p>0.05).

	GROUP N MEAN±SD	GROUP D MEAN±SD	P VALUE
AGE	30.66±11.58	32.5±12.28	0.52
WEIGHT	63.62±10.15	63.26±9.44	0.881
DURATION OF SURGERY	128±34.55	131±54.69	0.696
DURATION OF ANAESTHESIA	143.35±34.51	143.18±35.61	0.985

	Haemodynamic	Group N	Group N	P Value
Before Intubation	PULSE RATE	78.08±6.68	78.8±6.7	0.654
	MAP	95.54±5.55	95.4±5.62	0.917
	SPO2	98.48±1.03	98.28±0.99	0.411
After Intubation	PULSE RATE	92.3±7.89	92.28±7.69	0.99
	MAP	115.10±2.33	116.72±4.89	0.08
	SPO2	99.69±0.56	99.64±0.6	0.885
After Intubation	PULSE RATE	95.32±8.33	94.74±7.56	0.761
	MAP	115.9±3.29	117.12±3.32	0.126
	SPO2	98.42±1.03	98.22±1.04	0.126

BILLIVILLE SCORE

DURATION(HR)	GROUP N	GROUP D	P VALUE
0-8	1.42±1.49	0.64±1.21	0.018
8-16	0.28±0.76	0.14±0.61	0.395
16-24	0.16±0.62	0.00±0.00	0.129

RESCUE ANTIEMETIC

GROUP N	GROUP D	P VALUE
0.47±50	0.24±0.43	0.044

There was statistical significant difference in Belleville score in 0-8 hours of duration(p<0.05).There was no statistical significant difference after 8hours of surgery (p>0.05).There was statistical significant difference in required rescue anti emetic (metaclopromide 10 mg)(p<0.05)

DISCUSSION

The timing is crucial for administration of prophylactic antiemetic. Dexamethasone has longer onset time should be administered before induction. In our study we administered dexamethasone with preanaesthetic medication so that loner period of time to take effect. Eidi M et al[9] had also administered antiemetics before induction in their study.

Inhalational anaesthetic agents and nitrous oxide are leading cause of early PONV. These were avoided in our study[10].

dexamethasone is an effective antiemetic prophylaxis at a dose of 5-8 mg . Hence 8mg of dexamethasone was chosen as the dose in our study**.** Isik B[11] et al and Eidi M et al[9] administered 5 mg and 8 mg dexamethasone in their study respectively.

Eidi M et al had compared preoperative ondansetron and dexamethasone (8mg) in prevention of post tympanoplasty nausea vomiting. They observed that ondansetron and dexamethason were more effective than placebo group. Moreover they found that the incidence rate and intensity of PONV in the dexamethasone group was less than in ondansetron group[9].

Isik B.et al compared antiemetic effect of ondansetron and dexamethasone(5mg) on middle ear surgery. They found less incidences of PONV in ondansetron group than dexamethasone group[11].

Maitra et al[12] also concluded that dexamethasone is superior to ondensetron in preventing postoperative nausea after 4-6 of laproscopic surgery.

Wang et al[13] also concluded that dexamethasone as effective and safe as safe as ondensetron in preventing PONV. Dexamethason encouraged as an alternative to ondensetron for preventing PONV in patient undergoing laproscopic surgery.

Eberhart et al [14]also concluded that oral topisetron and dexamethasone both equally effective in reducing the severity and incidence of postoperative nausea and vomiting.

Our study dexamethasone as a prophylactic anti emetic also shows statistical significant difference between control group N and group D in PONV in duration of 0-8 hours. Requirement of rescue antiemetic metaclopromide was less in group D. We did not get any significant side effect of dexamethasone in single dose of dexamethasone like hyperglycemia, delayed wound healing, wound infection, gastric ulcer and avascular nacrosis.

CONCLUSION:

Dexamethasone is a prophylactic antiemetic in postoperative nausea vomiting without any side effect.

LIMITATION:

High risk group were excluded from this study.

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