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RESEARCH ARTICLE

GRANISETRON AND ONDANSETRON IN PREVENTION OF POST OPERATIVE NAUSEA VOMITING (PONV) IN TONSILLECTOMY

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ABSTRACT

The most distressing symptoms that follow anaesthesia and surgery are pain and vomiting. The aim of this study is to compare the antiemetic efficacy of granisetron against that of ondansetron by comparing the incidence of PONV using each drug. The surgical technique is highly standardized, therefore the choice of anaesthetic technique is the main variable available to influence PONV. Patients who received Granisetron and Ondansetron had significantly less PONV compared to the group that received normal saline; and with Granisetron the incidence was significantly lower than that with Ondansetron.

INTRODUCTION

Post Operative Nausea and Vomiting (PONV) has been associated for many years with general anaesthetics. The first extensive description of PONV was made by John Snow in 1848, within 18 months of introduction of chloroform in anaesthesia. (Andrew, 1992) During the ether era the incidence of PONV was as high as 75-85%. Sometimes PONV may be so distressing that it can affect the patient psychologically and physically and may prolong hospital stay. With the change in focus from inpatient to ambulatory anaesthesia, there has been an increase in the big little problem of nausea and vomiting. (Patricia, 1991, Gigilo, 2000) The intervention for managing PONV are both pharmacologic and nonpharmacologic. Various pharmacologic agents are rapidly coming up with increasing efficacy to prevent and treat PONV. The newer antiemetics are serotonin (5 HT_3) receptor antagonist (e.g.: Ondansetron, Granisetron) and NK-1 (substance-P) receptor antagonist. These have replaced the older antiemetics like phenothiazines, antihistaminics, butyrophenones and benzamides.To control PONV effectively one should have the knowledge of identification of high risk patients. Apfel and colleagues have developed a risk scoring system that appear predictive for PONV. (Apfel, 1999) Apart from strabismus surgery and laparoscopic procedure, tonsillectomy is regarded as a standard operation for the study of PONV. PONVis the most common cause of unscheduled overnight admission after ambulatory Tonsillectomy. The incidence of PONV can be as high as 70% during the first 24 hours after tonsillectomy. (Lerman, 1992)

MATERIALS AND METHODS

The present study was carried out at VSS Medical College Hospital, Burla, a tertiary referral center present in western Odisha, during the period from may 2009 to September 2012. Patients of ASA grade I and II,aged between 13-30 years of either sex scheduled for tonsillectomy were selected as study cases.

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Exclusion criteria

Patients with any known systemic, metabolic, endocrine disorder, allergy to drugs under study, history of PONV and motion sickness, anticipated airway difficulty.

Study type

A prospective randomized single blinded control study the patients were randomly divided into three groups of 30 patients each. The selected patients were given the drug diluted to 5ml or normal saline 5 ml over 2 minutes, 5 minutes before induction.

Group A:Normal Saline
Group B: Ondansetron (0.08mg/kg)
Group C:Granisetron (0.04mg/kg)

OBSERVATION

Clinical observations were done in 90 cases, all admitted and underwent tonsillectomy in the dept of otorhinolaryngology VSS Medical College, Burla. Observation on the patients demography, pre and intra-operative pulse, BP.SPO2, duration of surgery, PONV score and incidence were observed and recorded

DISCUSSION

PONV are observed after general, regional and local anaesthesia. Several factors such as patient factors like age, gender, obesity, anxiety, history of motion sickness, vomiting and gastro paresis; surgical factors like type of surgery and type of anaesthesia technique like use of I.V Anaesthetic or Inhalational agents, all control the PONV factor. (Koivuranta, 1997) The effect of PONV ranges from

Table 1. Patients Demography

Group	No of cases	Male	Female	Age(yr) ±SD	Weight(kg) ±SD
A	30	14(46.7%)	16(53.3%)	19.4± 4.0	49±5.3
B	30	16(53.3%)	14(46.7%)	20.2±4.27	50±5.4
C	30	15(50%)	15(50%)	19.8±4.37	49±5.7

The age, sex and body weight of patients in all three groups were comparable.

Table 2. Preoperative pulse, blood pressure and oxygen saturation

Group	No of cases	Pulse (b/m±SD)	Blood Pressure (mmHg)		Oxygen Saturation SPO2(%)±SD
			Systolic±SD	Diastolic ±SD	
A	30	78.76±10.1	121.9±7.3	81.4±4.6	98.5±0.8
B	30	81.03±9.4	121.3±7.4	80.8±4.7	98.5±0.8
C	30	81.6±8.03	120.8±6.9	79.9±5.2	98.4±0.8

Table shows there was no statistically significant difference in the base line values of the patients in the three groups.

Table 3. Intra-operative pulse, blood pressure and oxygen saturation & duration of surgery

Group	No of cases	Duration of surgery	Pulse (b/m±SD)	Blood Pressure (mmHg)		Oxygen Saturation PO2(%)±SD
				Systolic±SD	Diastolic ±SD	
A	30	38.56±4.4	83.1±7.7	125.2±10.2	83.0±4.4	100
B	30	38.7±4.11	84.5±6.2	122.5±8.4	80.6±6	100
C	30	38.51±4.36	84.0±7.8	126.63±7.4	84.1±5.1	100

None of the cases in the three groups showed tachycardia, bradycardia, hypertension, hypotension and hypoxia in the intraoperative period. There was also no significant difference in duration of anaesthesia in the three groups

Table 4. Mean post-operative nausea score

Group	0 hr	1 hr	2 hr	4 hr	8 hr	12 hr	24 hr
A	0	0	0	0.367	0.60	0.834	0
B	0	0	0	0.20	0.3	0.33	0
C	0	0	0	0	0.067	0.067	0

The nausea score of group A& B are higher in comparison to group C. Statistical analysis by paired t test indicates significance at 4,8,and 12 hours where as no significant difference observed at 0,1,2 and 24 hours.

Table 5. Mean postoperative vomiting score

Group	0 hr	1 hr	2 hr	4 hr	8 hr	12 hr	24 hr
A	0	0.133	0.133	0	0	0	0
B	0	0	0	0	0	0	0
C	0	0	0	0	0	0	0

There were no vomiting in group B & C. The vomiting score indicated vomiting at 1 & 2 hours in group A.

Table 6. Incidence of postoperative nausea and vomiting

Group	No of cases	Nausea	Vomiting	Total	No Sickness
A	30	17(56.67%)	7(23.23%)	17(56.67%)	13(43.34%)
B	30	8(26.67%)	0	8(26.67%)	22(73.33%)
C	30	2(6.67%)	0	2(6.67%)	28(93.33%)

Incidence of nausea and vomiting was highest in group A patients and incidence of no sickness was significantly highest in group C patients.

transient discomfort to even catastrophic complication like rupture of oesophagus. Other effects like dehydration, electrolyte imbalance, poor surgical outcome in ophthalmological, Head and Neck surgeries and abdominal wounds. Apfel *et al* have devised a simplified scoring system that gives a 20% risk to each of the following independent factors: (a) female gender (b) history of PONV and motion sickness (c) non smoker (d) predicted opioids use. If more than one factor is present preoperative prophylactic anti emetic should be administered. (Apfel, 2004)

The drugs used in premedication in all the three groups in the study were alprazolam, ranitidine, pentazocine, glycopyrrolate and midazolam. Of these midazolam has very low emetic potential and occurance of PONV with its use is lower during propofol and thiopentone anaesthesia. (Hvarfner, 1995)The intra operative drug used like nitrous oxide has been associated with higher incidence of PONV. (Sengupta, 1988) Many workers have shown avoidance of nitrous oxide and other inhalational agents can minimize PONV. (Randal, 1992) but others do not confirm it and these are still in common use in modern anaesthesia. From our study we found that the overall incidence of PONV in group A,B and C were 56.67%,26.67% and 6.67% respectively. The incidence of PONV without antiemetic prophylaxis i.e. group A was found to be close with the studies by Grace Brooke (2002) and Skacel (1986). The PONV incidence with Ondansetron 8mg IV was consistent with that of Dua *et al.* (2004) and lower than that of Loewen *et al* (2000). PONV incidence was only 6.67% with Granisetron 2mg that was found to be lower than the findings of Mikawa, *et al.* (1995). It has been observed in various studies that antiemetic therapy is often very effective in reducing incidence of vomiting or retching, but less so for nausea. Paul White *et al.* (2003) had opined that the 5HT3 receptor antagonists are very effective in controlling vomiting rather than nausea. The better response with Granisetron than with Ondansetron was also found to be similar to the studies made by Parhaizgar *et al.* (2005) and Dua *et al.* (2004).

Conclusion

From the present study, it is concluded that the patients who received Granisetron and Ondansetron had significantly less PONV compared to the group that received normal saline; and with Granisetron the incidence was significantly lower than that with Ondansetron. When nausea is not fully controlled by as in our study, whatever may be the factor, a combination therapy can be advocated to selected group of patients.

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