Original Article

Comparison between the effect of propofol(TIVA)and inhalational anesthesia(halothane)on early postoperative nausea and vomiting.

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Summary:

Background: Postoperative nausea and vomiting (PONV) is a highly observed feature postoperatively. The type of surgery, the technique, medication, duration of anesthesia, and various patient factors all contribute to the condition.

Objectives: To evaluate and compare the effect of halothane and propofol on early postoperative nausea and vomiting

Patients and methods: A randomized clinical trial was conducted on 80 patients who scheduled for hernioplasty during the 1st of October/ 2010 to the 5th of February/ 2012 in Baghdad Teaching Hospital / Medical City Complex / Baghdad / Iraq. All patients were allocated into two groups randomly (40 patients each), group(A) were received 1-2 mg/Kg propofol as induction and used for maintenance of anesthesia and group (B) were receive anesthetizing dose of thiopentone 3-5 Mg/Kg, and maintained on halothane. Presence of nausea and vomiting episodes were recorded at 4 time schedule (recovery, 2 hours, 4 hours and 6 hours) postoperatively in both groups.

Result: the incidence of nausea and vomiting were more among cases who received halothane, and along the time from recovery to 6 hours post operatively nausea and vomiting were absent in all cases of propofol group.

Conclusion: early PONV is less with propofol based anesthesia than with inhalational based anesthesia.

Keyword: Vomiting, nausea, postoperative, volatile anesthesia, propofol.

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Introduction:

At the anesthesiology editorial during 1997 Dennis Fisher called post-operative nausea and vomiting (PONV) the "Big Little Problem". (1) Why is this? The occurrence of PONV although associated with limited morbidity is amongst the primary concerns of patients following anesthesia and surgery. (2, 3, 4)The incidence of PONV has been reviewed by several authors. (5,6,7,8,9), and found to be dependent on a variety of factors related to the patient, the procedure and the anesthetic. The overall incidence varies from 22-38 %.(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. (6) Propofol is now well recognized as an antiemetic and has been associated with a decreased incidence of PONV when used as the induction agent for brief procedures (< 60 Minutes) or as part of a Total Intravenous Anesthetic (12). The volatile anesthetics are associated with a similar increase in the incidence of PONV in the first 2 hours post-operatively. (11, 13).This study was conducted to evaluate and compare the effect of halothane and propofol on early postoperative nausea and vomiting.

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Patients and methods:

A randomized clinical trial was conducted on,80 class 1 and2 ASA) American society of anesthesia classification) patients during the 1st of October/ 2010 to the 5th of February/ 2012 in Baghdad Teaching Hospital , Medical City Complex, Baghdad, Iraq. All patients have been scheduled for elective hernioplasty and their age between (20-54) years. Any patient with history of Motion Sickness , 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 drugs used in this study, and pregnancy were excluded from the study.Demographic data of all patients (age, gender, weight, and height) were recorded using an already prepared data collecting sheet. All patients were allocated into two groups randomly (40 patients each), group(A) received 1-2Mg/Kg Propofol as induction and used for maintenance of anesthesia and group (B) received anesthetizing dose of thiopentone 3-5 Mg/Kg, and maintained on halothane. Both group received medazolam 0.02 Mg/kg, fentanyl1microgram/Kg,dexamethasone8Mgmetoclopromide 10 Mg, and atracurium 0.5 Mg/Kg. All patients endotracheally intubated, monitored by SPO2 , NIBP , pulse rate , andECG , and at the end of surgery reversed by neostigmin 2.5Mg and atropine 1.2 Mg. Each individual patient was monitored and observed carefully postoperatively, the nausea attacks and

the vomiting episodes were recorded at 4 time schedule (at recovery, 2 hours, 4 hours and 6 hours) postoperatively in both groups. Numerical analogue scale (NAS) was used to assess nausia, where 0= no nausea and 10= nausea as bad as can be and rating as: NAS: 1-3 = mild, 4-7 =moderate, 8-10 =severe. The severity of emetic episodes in terms of number of episodes per patient in each group was tabulated and classified as: Mild = < 2, Moderate = 2, and Severe > 2 episodes. Data of all cases were statistically analyzed, and P.value set at ≤ 0.05 were considered as significant.

Results:

All 80 cases were undergone surgical operation for hernia repair ,they were allocated into two groups with 40 patient in each; group(A) who received Propofol and group(B) who received Halothane.

Out of all cases males were 39 (48.8%), while female were 41(51.2%), there was no significant difference within gender, P>0.05, figure (1).

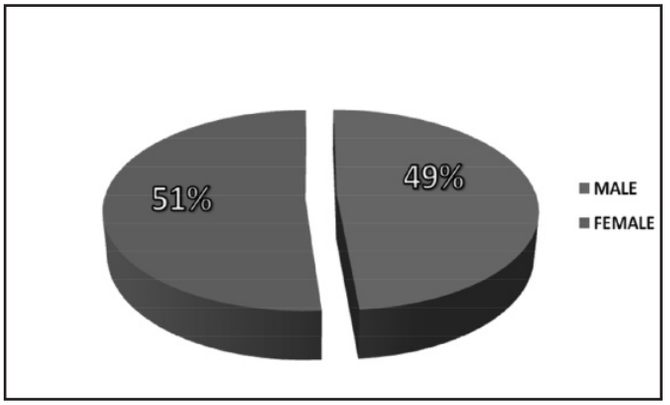

Figure (1) distribution of cases by Sex (N=80)

The mean age of all cases was (37.2 years ± 9.1 SD) and the range (20 – 54) the mean age of propofol group was (38.27± 8.8) year and it was (35.2 ± 9.2) for halothane group respectively. The majority of cases (62.5%). aged (30 – 49) years ; the difference in age between both groups was statistically not significant (P.value > 0.05), figure (2).

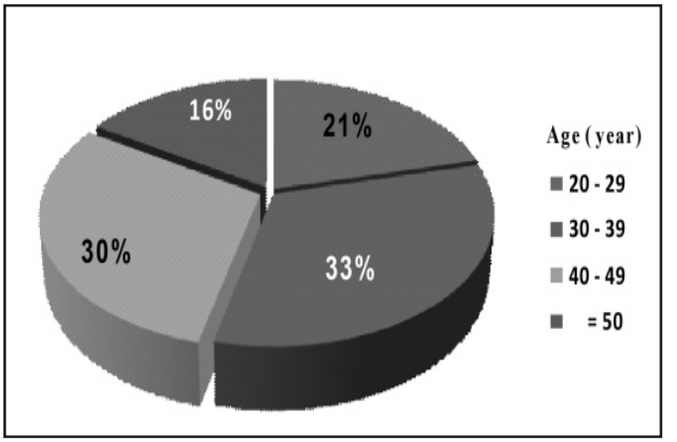

Figure (2) Distribution of cases Age group (N=80).

Tables (1) and (2) summarized the frequencies and percentages of nausea and vomiting in both groups , it had been found that, in general, nausea and vomiting were more prevalent only among cases who received Halothane and along the time from recovery to 6 hours post operatively nausea and vomiting were absent in all cases of Propofol group. A highly significant association between the type of medication and the occurrence of nausea and vomiting at recovery time and at 6 hours time P.value < 0.001. On the other hand there was no significant difference in between both groups at 2 hours and 4 hours' time, P.value > 0.05.

Table (1): VAS frequencies distributed by time.

Nausea (VAS)		Anesthesia			P.value
		Propofol	Halothane	Total	
At recovery	ABSENT	40 (100%)	23 (57.5%)	63 (78.8%)	0.000021
	MILD	0	9 (22.5%)	9 (11.2%)	
	MODRATE	0	8 (20%)	8 (10%)	
At 2 hrs	ABSENT	40 (100%)	39 (97.5%)	79 (98.8%)	0.314
	MILD	0	1 (2.5%)	1 (1.2%)	
At 4 hrs	ABSENT	40 (100%)	40 (100%)	80 (100%)	(not available)
At 6 hrs	ABSENT	40 (100%)	23 (57.5%)	63 (78.8%)	0.00018
	MILD	0	12 (30%)	12 (15%)	
	MODRATE	0	5 (12.5%)	5 (6.2%)	
Total		40 (100%)	40 (100%)	80 (100%)	

Table (2) Vomiting frequencies distributed by time.

Vomiting		Anesthesia			P.value
		Propofol	Halothane	Total	
At recovery	ABSENT	40 (100%)	24 (60%)	64 (80%)	0.000045
	MILD	0	11 (27.5%)	11 (13.8%)	
	MODRATE	0	5 (12.5%)	5 (6.2%)	
At 2 hrs	ABSENT	40 (100%)	39 (97.5%)	79 (98.8%)	0.314
	MILD	0	1 (2.5%)	1 (1.2%)	
At 4 hrs	ABSENT	40 (100%)	40 (100%)	80 (100%)	(not available)
At 6 hrs	ABSENT	40 (100%)	23 (57.5%)	63 (78.8%)	0.000021
	MILD	0	9 (22.5%)	9 (11.2%)	
	MODRATE	0	8 (20%)	8 (10%)	
Total		40 (100%)	40 (100%)	80 (100%)	

Discussion:

PONV is still among the most common and troublesome complications of surgery, causing delays in patient discharge from hospital, especially in outpatient surgeries. Therefore, therapeutic strategies preventing this complication are of utmost importance. According to the results in this study, the use of halothane was the strongest triggering factor for development of early PONV. Detailed analysis has shown that this effect was restricted to early postoperative period (0-2 h), also it depend on the degree of exposure as quantified by duration of anesthesia.Sneyd JR and his colleagues (14) in their meta-analysis of nausea and vomiting following maintenance of anesthesia with propofol or inhalational agent, they analyzed a number of prospective randomized comparative studies have suggested that there is a reduction in post-operative nausea and vomiting following maintenance of anesthesia with propofol compared with inhalational agents in more detail by examining the effects of induction agent, choice of inhalation agent, presence/absence of nitrous oxide, age of patient or use of opiate on the incidence of emesis. They found that patients who received maintenance of anesthesia with propofol had a significantly lower incidence of post-operative nausea and vomiting in comparison with inhalational agents regardless of induction agent, choice of inhalation agent, presence/absence of nitrous oxide, age of patient or use of opiate. (14) This agrees with the result of this study.Borget A. and his colleagues (15) in their a prospective, randomized, double-blind, placebo-controlled study, subhypnotic doses of propofol possess direct antiemetic property, 1992, they investigated the possible direct antiemetic properties of a subhypnotic dose of propofol. Fifty-two patients with nausea and vomiting after minor gynecologic, orthopedic, or digestive tract surgery, were received either propofol (10 mg = 1 mL) or placebo (1 mL Intralipid) intravenously in the postanesthesia care unit. Patients treated with propofol experienced a larger reduction in nausea and vomiting than patients treated with placebo (81% vs 35% success rate; $P < 0.05$). They concluded that propofol has significant direct antiemetic properties. (15) This supports the result in this study.Thomas O. Erb and his colleagues (16) studied postoperative nausea and vomiting in children and adolescents undergoing radiofrequency catheter ablation: a randomized comparison of propofol- and isoflurane-based anesthetics. In children, radiofrequency catheter ablation (RFCA) is typically performed under general anesthesia. With the use of volatile anesthetics, postoperative nausea and vomiting (PONV) are common, with an incidence of emesis as frequent as 60%. They tested the hypothesis that a propofol (PRO)-based anesthetic would have a less frequent incidence of PONV than an isoflurane (ISO)-based anesthetic. Patients were randomly assigned to receive either an ISO- or PRO-based anesthetic. Prophylactic ondansetron was given to all patients and droperidol was used as a rescue antiemetic postoperatively while PONV was monitored postoperatively for 18 h. The cumulative incidence of PONV was significantly more frequent in group ISO (63% nausea/55% emesis) compared with group PRO (21% nausea/6% emesis). After the administration of droperidol, further vomiting occurred in 70% of the patients in group ISO versus 0% of the patients in group PRO. They concluded that RFCA using ISO has a high PONV risk and the prophylactic use of ondansetron as well as antiemetic therapy with droperidol are ineffective. In contrast, a PRO-based anesthetic is highly effective in preventing PONV in children undergoing RFCA. (16) This agrees with the result in this study. Gan, T.J., et al. (17), in their study: Double-blind, randomized comparison of ondansetron and intraoperative propofol to prevent postoperative nausea and vomiting. They concluded that propofol administered to induce and maintain anesthesia is more effective than ondansetron (with thiopental-isoflurane anesthesia) in preventing postoperative vomiting and is associated with fewer requests for rescue antiemetic and

sedation in the early phase of recovery. It is equally effective in preventing postoperative nausea as ondansetron in the first 6 h after operation. (17) This supports the result in this study.Therefore, the effect of halothane (inhalational) based anesthesia must be considered the main cause of PONV in early postoperative period.In this study there may be also a relation to the analgesic (tramadol) which is used postoperatively and incidence of nausea & vomiting at 4-6hr.

Conclusion:

Early PONV is less with anesthesia maintained on I.v. propofol than with inhalational based anesthesia.

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