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Comparison of incidents of nausea and vomiting between general anesthesia With Endotracheal tube and spinal anesthesia in cesarean sections

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ABSTRACT

Introduction: Nausea refers to a sense of vomiting inclination, while Vomiting refers to reflux of the gastric contents, it is multidimensional phenomena influenced by a variety of risk factors began during the operation and persisted in the recovery period. Postoperative phase results in decreased patient comfort, an extended stay in the PACU.

Aim: To determine and compare which type of anesthesia leading to higher incidence of nausea and vomiting.

Patients & Methods: (110) patients of 18-40 years with ASA I and II were assigned according to the type of anesthesia that will be used. The two groups of study (general and spinal anesthesia) each group contain 55 participants. Within the groups 28 of parturient received metoclopramide while the other 27 women were received ondansetron. Measuring times of episodes of intra-postoperative NV, time of recovery, hemodynamic parameters before and after incidents of NV, times of drug administration. Data analysis done by SPSS version 24.

Results: times of episodes of NV was significantly less in spinal anesthesia group compared to general group ($p<0.05$) moreover, significant decrease of systolic and diastolic BP before and after intra - postoperative NV was obvious in spinal anesthesia group, in addition times of drug administration with metoclopramide in spinal group was high significantly($p<0.05$).

Conclusion: spinal anesthesia technique achieved better result in the term of reducing the incidence of NV, Moreover 4mg I.V of ondansetron significantly related to decrease in IONV, PONV rather than 10 mg of metoclopramide.

Keywords: *Nausea, Vomiting, General Anesthesia, Spinal Anesthesia, Cesarean Sections*

INTRODUCTION

Postoperative nausea and vomiting (PONV) is a common complication of anesthesia and can lead to patient dissatisfaction and discomfort. (1,2).Early PONV is generally occur within 2 hours after surgery, whereas late PONV is commonly characterized as occurring between 24-48 hours after surgery. (3). Individual studies show a prevalence of 20%–30% in normal groups and 70%–80% in high risk populations. PONV has numerous adverse effects on patients, including decreased quality of life and overall satisfaction, dehydration, electrolyte imbalance, aspiration of gastric secretions, esophageal rupture, bleeding, increased morbidity, delayed discharge from hospital, delayed return to work, and most significantly, increased rehospitalization.(4) Moreover, the risk factors for PONV are patient-specific, surgery-related, and anesthesia-related, whereas the independent risk factors for PONV are female gender, a history of PONV or motion sickness, nonsmoking status, and intraoperative opioids, according to the simplified Apfel score risk assessment. (5) Currently regional anesthesia administered to 80% of anesthetized patients, while only 20% receive general anesthesia (6) due to the potential advantages of minimal airway intervention, less cardiopulmonary depression, superior postoperative analgesia, less postoperative nausea and vomiting, and shorter recovery room and hospital stays(7). General anesthesia is mostly performed for emergency grade 1 caesarean section and due to a lack of time to apply a neuraxial anesthetic approach.(8)

Aim of study: To determine better type of anesthesia techniques and less incidence rate of PONV, and Treatment for it.

PATIENTS AND METHODS

Subjects and study design:

The parturient women who underwent cesarean section in AL-Habobi Hospital in Di_qar, IRAQ, were participated in this cross sectional study according to the inclusion and exclusion criteria. All Patients aged between 18 − 40 years, with ASA class I and II. Written and verbal informed consent was obtained from each study participant after clear explanation of merits and demerits of the study. The data was collected between September and December 2022. A total of 110 parturient women were randomized into two groups with 55 parturient women in each group. The group given general anesthesia was defined as the G.A (General anesthesia) group, and the group given spinal anesthesia as the S.A (Spinal anesthesia) group. All parturients scored 40% risks of PONV on Apfel score for only two available grades (female, non-smoker).

Inclusion Criteria

18-to-40-year-old patients scheduled for elective cesarean sections without complications were recruited for this study.

Exclusion Criteria

Patients with a history of motion sickness, past postoperative emesis, gastrointestinal disease, or use of antiemetic medicine within the preceding 24 hours, an allergy to the research agents, or any contraindication for spinal anesthetic were excluded from the study.

Methods of anesthesia

After skin preparation and IV line insertion (18 G cannula), infusion with 0.9 (1 L) of normal saline began, antacid and antiemetic administrated as premedication for general and spinal groups .Include (ranitidine 50 mg I.V for all patients, the fifty five participant divided 28 patient received 10 mg of metoclopramide , and 27 patient received 4 mg of ondansetron in each group). parturients were given 100% O2 for 3 min prior to induction. Left uterine displacement was maintained. Cricoid pressure was applied during a rapid sequence induction with propofol (2 mg/kg) and succinylcholine (1-2mg/kg) and the trachea was intubated with proper size endotracheal tube. Non-depolarizing muscle relaxant (Atracurium 0.5 mg/kg, or Rocuronium bromide 0.6 mg/kg) were administered when muscle relaxation was required. Ketamine given 50 mg for analgesia. Anesthesia maintained with 1 % isoflurane until the delivery of infant and clamping of the cord was decreased to 0.5%. At the end of surgery, patients are administered neostigmine (2.5 mg) and atropine (0.6 mg) to reverse the impact of muscle relaxants. Atropine (0.6 mg) and 1 ml of ephedrine, 50 mg diluted to 10 ml (5 mg /ml) with normal saline, administered according to the patient's hemodynamic condition in G.A and S.A groups.

A group was administered spinal anesthesia after prepping the skin and preparing the kits required for this operation, which typically include

chlorhexidine with alcohol, a drape, and a local infiltrating anesthetic hyperbaric 0.5% bupivacaine 10 mg (2 ml). A Pencil-point needle (22 gauge), 5 ml syringes, and preservative-free spinal anesthetic solution are also included. With the patient seated, the subarachnoid space was perforated through the L2–L3 or L3–L4 interspace and injected with a spinal needle. Some Parturients received low flow oxygen with nasal cannula which is more comfortable to spinal group, the anesthetists who administered anesthesia were unaware of the study strategy.

In order to reduce the risk of intraoperative hypotension 15 ml/kg of Ringer solution was administered intravenously within 10 minutes prior to the commencement of the spinal block, and patients were placed in a slight left lateral position. The hypotension was controlled by vasopressors such as ephedrine. The incidence and frequency of nausea and vomiting in the two groups were documented during intra and within 2 hours postoperatively, following medication induction, and in the recovery room. Oxygen saturation, pulse rate and systolic blood pressure of each woman was monitored and recorded every 5 min during the surgery and every one hour post-operatively during the study period.

After delivery of baby (0.3 to 1 UI) IV bolus of oxytocin over 1 min followed by an intravenous infusion of (5-10 IU/h for 4 h), administrated to control postpartum hemorrhage and stimulate uterine contractions. Also for pain management we use 1g of paracetamol (100 ml) administrated for the study groups. Furthermore opioid not used in this respect.

Data collection and analyzing: Data was collected according to the questionnaire which developed by the researcher under the guidance of an expert anesthesiologist. Data were statistically processed using SPSS 24.0 software package and before statistical analysis, all groups are tested to see if the data is distributed normally Normality tests (Kolmogorov-Smirnov, Shapiro-Wilk) .the measurement data were expressed as mean ± standard deviation (m±SD), and were compared between 2 groups based on independent-sample t-test. The enumeration data were expressed as frequency/percentage (N/%), and were compared between the 2 groups based on chi-square test or Fisher's exact test. Paired, unpaired Samples Statistics and Correlations used for comparison between hemodynamic parameters before and after IONV &PONV all alone. P value of <0.05 was considered significant.

RESULTS

Table 1: *Demographical and clinical characteristics of patients*:

Variable	General Anesthesia N=55	Spinal Anesthesia N=55	p-value
Age (yr. ±S.D)	27 (±6.60)	29.35 (±5.98)	0.053
ASA Ⅰ %	41(74.5%)	47(85.5%)	0.233
Ⅱ	14(25.5%)	8(14.5%)	
Antiemetic %	28 (50.9%)	28(50.9%)	1.000
Metoclopramide Ondansetron	27(49.1%)	27(49.1%)	
NV after drug %	2(3.6%)	9(16.4%)	0.052
Occur Non	53(96.4%)	46(83.6%)	
Times of drug add. %	53(96.4%)	47(85.5%)	0.093
1st 2nd	2(3.6%)	8(14.5%)	
Time of recovery (min ±S.D)	64.4 (±30.78)	59.4 (±35.35)	0.439
B.PONV .SBP mmHg	111.87 (±21.30)	92.26 (±14.88)	0.001
B.PONV .DBP mmHg	69.07(±13.29)	61.16(±7.433)	0.019

B.PONV .HR (beat/min)	75.048(±11.46)	70.40(±19.572)	0.252
B.PONV .SPO2%	98.4(±1.184)	98.7(±1.685)	0.357
A.PONV.SBP mmHg	123.6(±19.53)	111.5(±10.83)	0.014
A.PONV.DBP mmHg	75.4(±9.90)	67.2(±9.16)	0.004
A.PONV.HR (beat/min)	80.92(±8.79)	79.8(±7.46)	0.627
A.PONV.SPO2%	98.12(±1.144)	98.3(±1.726)	0.708

Table 1: Age, ASA Ⅰ / Ⅱ, antiemetic, NV after drug administration, times of drug administration and time of recovery was statistically not significant among the S.A and G.A groups (p >0.05).

Table1: Hemodynamic parameters before and after PONV among women with general anesthesia vs. women with spinal anesthesia:

Before PONV

1) Systolic blood pressure among general anesthesia is higher significantly than those with spinal anesthesia p= 0.001.
2) Diastolic blood pressure among women on general anesthesia is significantly higher than those on spinal anesthesia with p= 0.019
3) The heart rate did not differ significantly (p=0.252) between the general anesthesia group
4) The SPO2% did not differ significantly between the two groups of interest with (p= 0.357>0.05).

After PONV

1) Two significant results among the hemodynamic parameters are present. First, the mean systolic blood pressure among the spinal anesthesia group is lower than the general anesthesia group with (p= 0.014). Second, the mean diastolic blood pressure differs significantly among general anesthesia and spinal anesthesia (p= 0.004) with higher value among general anesthesia.
2) The mean of the heart rate after PONV is slightly higher among general anesthesia group compared to the spinal anesthesia group but this increase is not significant (p= 0.627). The mean percentages of SPO2 is almost the same for the two types of anesthesia insignificantly (p=0.708)

Table 2: Times of episode of nausea and vomiting (Frequency) in general and spinal group:

Group	Times of episode of NV				p-value
Antiemetic in G.A	0.0	1.0	2.0	>3.0	
Metoclopramide	2 (3.6%)	22 (40%)	4 (7.3%)	0	0.002
Ondansetron	12(21.8%)	15(27.3%)	0		
Total %	14(25.5%)	37(67.3%)	4(7.3%)		
Antiemetic in S.A					
Metoclopramide	11 (20.0%)	7 (12.7%)	10 (18.2%)	0	0.003
Ondansetron	15 (27.3%)	12 (21.8%)	0		
Total %	26 (47.3%)	19 (34.5%)	10(18.2%)		

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Table 2: In total the patients who received spinal anesthesia were less prone significantly to develop nausea and vomiting compared to those with general anesthesia respectively [26(23.6%), 14(12.7%)]. alsoThe patients who developed of NV for once were significantly higher among general anesthesia type compared to that of spinal anesthesia [37(33.6%) to 19(17.3%)] respectively. Finally for the patients who developed NV for twice those who on spinal anesthesia were higher significantly [10 (9.1%) to 4 (3.6%)] than those with general anesthesia.

Table 3: Comparison of time of recovery among general and spinal anesthesia group

TYPE OF ANESTESIA	Time Of Recovery				p-value
	30 min	60 min	90 min	120 min	
General Anesthesia	28(25.5%)	10(9.1%)	7(6.4%)	10(9.1%)	0.085

Spinal Anesthesia	19(17.3%)	15(13.6%)	15(13.6%)	6(5.5%)	
Total	47(42.7%)	25(22.7%)	22(20%)	16(14.5%)	

When considering general anesthesia compared to spinal anesthesia in the term of time of recovery, parturient recovered from spinal anesthesia faster than general anesthesia, However this value was not significant (p=0.085) .

Table 4: Frequency, percentage and paired samples test of IONV within spinal anesthesia group

IONV with S.A	20(36.4%)	Mean ±S.D	p-value
Occur non	35(63.6%)		
Pair 1 B.IONV SBP		-13.950(±21.15)	0.008
A.IONV SBP			
Pair 2 B.IONV DBP		-6.80(±12.26)	0.023
A.IONV DBP			
Pair 3 B.IONV HR		-6.25(±17.14)	0.119
A.IONV HR			
Pair 4 B.IONV SPO2%		0.450(±1.572)	0.216
A. IONV SPO2%			

Noticeably the incidence of intra operative nausea and vomiting with spinal anesthesia scored as 20(36.4%) to 35(63.6%) free of it among 55 participants in S.A group. Coming to Correlation among hemodynamic parameters in spinal anesthesia during IONV. Spinal anesthesia is correlated significantly with the two hemodynamic parameters during IONV where there is significant decrease in systolic and diastolic blood pressure (p< 0.05). Thus, there is insignificant decrease in heart rate and increase in SPO2% respectively (p=0.119) beats per minute with (p=0.216).

Table 5: Paired test of PONV in general and spinal group

Group	Mean difference ±S.D	p-value
General Anesthesia n = 41 Pair 1 Before PONV SBP After PONV SBP	-11.78(±13.30)	0.001
Pair 2 Before PONV DBP After PONV DBP	-6.29 (±11.85)	0.002
Pair 3 Before PONV HR After PONV HR	-5.87 (±9.171)	0.001
Pair 4 Before PONV SPO2% After PONV SPO2%	0.317 (±1.254)	0.113
Spinal Anesthesia n=19 Pair 1 Before PONV SBP After PONV SBP	-19.21 (±13.11)	0.001
Pair 2 Before PONV DBP After PONV DBP	-6.053 (±7.367)	0.002
Pair 3 Before PONV HR	-9.386 (±17.21)	0.029

After PONV HR		
Pair 4 Before PONV SPO2% After PONV SPO2%	0.526 (±1.219)	0.076

Table 5: correlation among hemodynamic parameters in general anesthesia before and after PONV .General anesthesia is correlated significantly with lower mean systolic blood pressure, lower mean diastolic blood , lower mean heart rate respectively before and after PONV respectively (-11.78± 13.30 mmHg with p=0.001, -6.29±11.84 mmHg with p=0.002, -5.87±9.17 beats per minute with p=0.001). Regarding SPO2%, there is decrease in SPO2 (-0.10±0.64 beats per minute) and the change is not significant (p=0.113).

Correlation among hemodynamic parameters in spinal anesthesia before and after PONV.Spinal anesthesia is correlated significantly with more decrease in mean systolic blood pressure before and after PONV (- 19.25±13.11 mmHg with p=0.001) compared to general anesthesia, and in significant decrease in mean diastolic blood pressure (-6.30±9.23 mmHg with p=0.002). The mean heart rate is significantly lower before and after PONV with (p=0.029) (-6.30±6.98 beats per minute).finally the changing in SPO2% percentage is not significant and slightly higher by 0.5±1.19 % p=0.076 before and after PONV.

Table 6: type of anesthesia antiemetic, times of administration of antiemetic drug in the two groups:

G.A group	Times of drug administration		p-value
	First	Second	
Metoclopramide	26(47.3%)	2(3.6%)	0.491
Ondansetron	27(49.1%)	0.0	
Total%	53(96.4%)	2(3.6%)	
S.A group			
Metoclopramide	20(36.4%)	8(14.5%)	0.004
Ondansetron	27(49.1%)	0.0	
Total%	47(85.5%)	8 (14.5%)	

As it shown in table 6, Times of administration of metoclopramide in the spinal group for the second time was significant (p=0.004) .compared to no additional doses given with patient who received ondansetron .

Discussion:

this study was conducted with primary purpose to examine the association between the episodes of NV among the two types of anesthesia besides the changes in hemodynamic criteria, the impact and times of administration of metoclopramide and ondansetron as antiemetic drugs during perioperative period in order to management of nausea and vomiting .

Hemodynamics Criteria among Parturient Women and its Association with Spinal and General Anesthesia

The results showed that the systolic and diastolic BP values before , after nausea and vomiting were lower among spinal group significantly compared to general anesthesia group (Table 1,4,5) possibly hypotension occur after induction of spinal anesthesia. Hypotension is the most common side effects of spinal anesthesia due to preganglionic sympathetic inhibition. Vasodilation caused by sympatholytic generated by a spinal block produces hypotension in mothers. Hypotension following a spinal anesthesia-assisted caesarean delivery has been the topic of medical investigation for over fifty years. In different studies, the incidence of hypotension during spinal anesthesia for cesarean section ranges from 7.4% to 74.1%.(9)

In research investigations, the two most prevalent definitions of hypotension are a fall to 80% of the baseline blood pressure value determined before anesthesia or a combination of two criteria, i.e. a drop of SBP to 100 mmHg or less, or a drop to 80% baseline or less(9) (10). Ngan Kee et al. found

a substantial improvement in the incidence decrease of nausea and vomiting when SBP was maintained at the baseline level, as opposed to 90% to 80% of the baseline SBP level. (11) Hence, according to the 2018 consensus, the goal should be to maintain SBP ≥ 90% of the baseline value obtained before to spinal anesthesia and to avoid a decline to 80% of the baseline value (12).

Our study in line with previous research indicating that the primary disadvantage of spinal anesthetic is maternal hypotension, which can affect up to 90 % of women and result in dizziness, nausea, and vomiting, and in severe instances, fetal bradycardia and cardiovascular collapse. Decreased systemic vascular resistance induces hypotension, which is aggravated in the parturient by compression of the inferior vena cava and partially compensated for by an increase in stroke volume and heart rate (13) (14). also, in agreement with other study shows that untreated severe hypotension can pose serious risks to both the mother and the infant (unconsciousness, pulmonary aspiration, apnea, and even cardiac arrest) (impaired placental perfusion leading to hypoxia, fetal acidosis, and neurological injury).

Spinal anesthesia produces hypotension via multiple pathophysiological processes, the most important of which is the fast start of sympatholysis due to increased sensitivity of nerve fibres to local anesthetics during pregnancy (15). Hence, sympatholysis results in a greater degree of peripheral vasodilation and a predominance of parasympathetic activity, resulting in a decrease in venous return and cardiac preload, as well as bradycardia, nausea, and vomiting. (16)

Intraoperative hypotension, reduced cardiac output due to vena cava compression, uterotonic drugs such as oxytocin and particularly Methergine, exteriorization and manipulation of the uterus, intestines, and peritoneum, as well as psychological distress may contribute to the high incidence of NV(6). Prophylactic phenylephrine was administered to maintain blood pressure changes within 20% of the baseline in order to prevent hypotension's influence on nausea and vomiting. (17)

Our study demonstrated that there were a significant decrease in values of heart rate within spinal group before and after incidence of PONV, however this change in heart rate was also differ significantly in general anesthesia group due to number of parturient who witness PONV in general group were 41 compare to 19 of whole participants in S.A group but still the mean of HR before and after general anesthesia recorded more stable values with general anesthesia. In similar study Three hundred twenty-seven patients (16.4%) had a heart rate less than or equal to 50 beats / min. Even the p-value from a univariate analysis of all investigated covariates was below 0.05. Only crude odd ratios of sex of male, age equal to or more than 50 year and high dose of heavy bupivacaine were identified as risk factors of bradycardia following spinal block. (18) A study in Thailand demonstrate that the peak onset of hypotension and bradycardia occurred within one and three minutes, respectively, following spinal anesthesia. In some situations, the lowest blood pressure occurred at 45 minutes after block and might be the impact of other reasons such as blood loss. In 50% and 75% of cases, the lowest blood pressure and heart rate were observed at 3.5% and 5 minutes (18). In addition reduced pre-load following spinal anaesthesia begins reflexes that induce severe bradycardia. Atropine is often utilized as both the first line of treatment and as a preventative measure. (19)

(Neal, 2000) found The likelihood of developing bradycardia during a spinal anesthetic is increased in patients with baseline heart rates below 60 bpm, commonly held belief that bradycardia is associated with high sensory blockage, a spinal sensory level above T5 is only a weak predictor of bradycardia and does not correspond with the severity of bradycardia. Moderate hypotension or bradycardia may be treated by volume expansion, ephedrine, or atropine. However, bradycardia that is severe and/or advancing rapidly requires aggressive treatment with epinephrine and, if necessary, cardiac resuscitation. Although the data in favor of prophylactic volume loading or vasopressor medication is somewhat contentious, it is usually unsupportive(20)

Although general anesthesia provides an advantage of rapid induction, reduced hypotension, cardiovascular stability and better control over airways and ventilation. But still there is risks that linked to general anesthesia approach may result in loss of control of the airway (failed intubation), anoxia, and aspiration of gastrointestinal contents

are the primary concerns about the use of general anesthesia in the obstetric population. Consciousness and medication toxicity are few other problems connected with general anesthesia. (21) (19) Fetal depressive effects of intravenous and volatile drugs Since general anesthetics may breach the placental barrier, fall in APGAR and NACS fetal hypoxia-acidosis caused by hyperventilation, and delay in breast-feeding may occur under general anesthesia for cesarean section .. (22) All of that led to regional methods being employed wherever practicable.

Association of Episodes of Nausea and Vomiting, antiemetic drugs Among Parturient Women with General and Spinal Anesthesia

According to our results, times of episodes of NV with general anesthesia group in this sequence (0,1,2,>3) the incidence percentage was (3.6% , 40% , 7.3%) when metoclopramide used , in the same context ondansetron scored episodes of NV as (21.8%,27.3%) respectively while, in spinal anesthesia group metoclopramide recorded times of episodes as following (20% ,12.7% , 18.2%),moreover the episodes percentage that related to ondansetron administration was (27.3% , 21.8%) (Table 2). Eventually ,spinal anesthesia group achieved better result in the term of no episodes recorded of NV with total percentage of 47.3% compared to 25.5% in general group ,in addition ondansetron achieved higher outcomes in reducing the prevalence of nausea and vomiting during intra and postoperative phases. In line study of twenty patients in the inhalational group (50.9%) and 9 patients in the TIVA group experienced PONV. This difference identified between the research groups was statistically significant ($p < 0.001$) the total incidence of PONV in our study sample was 34.3%, or 36 out of 105 individuals. The incidence of nausea without vomiting was also significantly different between the two groups ($p = 0.002$). The requirement for antiemetic rescue medication administration varied across the two groups. Thirteen patients in the inhalational group (24.5%) required medical intervention to manage vomiting, compared to five patients in the TIVA group (9.6%) ($p = 0.043$)(23) Also Rohm et al.19 (24) found that the incidence of PONV was 0% in the intravenous group and 33.35 % in the inhalation group. Just eight percent of individuals in the inhalation group needed antiemetic medication. Other study by Kim et al. (25), found that the incidence of PONV in the intravenous group was 14.6% and in the inhalation group it was 51.3%. Moreover, 4.2% of the intravenous group and 25.6% of the inhalation group reported the amount of antiemetic medication administered.

Our findings shows that the incidence of intra operative nausea and vomiting scored as (36.4%) among 55 participants in S.A group(table 5).in accordance with previous findings in this observational trial, the overall incidence of intraoperative and early postoperative nausea and vomiting in the treatment group was 25.8% while in the non-treatment group it was 48.5%. This reduction in the incidence of IONV was high significantly among metoclopramide group and non-prophylaxis groups ($p=0.008$)(26) This study found that the overall incidence of intra-operative nausea and vomiting was 69 (18.5%), while the incidence of intra-operative nausea alone was 152 (40.8%). Fourteen (3.8%) parturients suffer from moderate vomiting (27) This difference among our study and these studies may related to variated sample size.

Multiple large-scale studies and Cochrane systematic reviews indicate that preventative ondansetron treatment reduces PONV by 25% ; (28) (29) Ondansetron prevents vomiting or the need for rescue medication more efficiently when provided at the end of surgery, most likely due to its short t1/2b, particularly 2 to 24 hours after surgery. (30). According to studies, ondansetron is statistically superior to metoclopramide for preventing PONV (31) (32). Other study suggest that The optimal intravenous dose is 4 mg provided at the end of surgery. 40 to 70 percent of individuals who get prophylactic treatment respond completely. In patients at high risk, combined therapy is advised. Moreover, Apfel et al. demonstrated that in a combination of anti-emetics, each agent has an additional proportional impact, meaning that a double or triple combination is twice as effective as a single treatment. Comparing ondansetron, dexamethasone, and droperidol, for instance, reveals a 30% step-wise reduction in NV risk for each individual drug ((28), which was evaluated in the context of general anesthesia.

Association between antiemetic drugs with times of drug administration

The correlation among type of antiemetic and need for second or more dosages of drug shown that metoclopramide achieved a significant value of (14.5%) in parturient who underwent spinal anesthesia (table 6) in line study In terms of the need for rescue antiemetic medication in the recovery room, there was a statistically significant difference between the ondansetron and metoclopramide groups (P=0.024): 6 (20%) of the origin 30 participants in the metoclopramide group required an additional dose of medication, whereas the ondansetron group did not record any such need.(33)

Other studies found that 20 mg of metoclopramide was ineffective, presumably due to the small sample sizes (40, 129, and 51 patients per group) (34) (35) .In the end no single antiemetic medication has proven to be an all-encompassing treatment for postoperative nausea and vomiting. The addition of 25 mg or 50 mg metoclopramide to the standard intervention of 8 mg dexamethasone was found to be efficacious, safe, and inexpensive. (36)

Difference in Time of recovery between the study groups

Our result revealed that time of recovery in the group of women under spinal anesthesia achieved better results during the postoperative intervals (60,90,120 min) respectively .even though general anesthesia group recorded higher number of parturient who relieved from signs and symptoms of nausea and vomiting in the first 30 min after surgery**.** However, this difference statically was not significant (p=0.085) (table 3).We detected a statistically significant difference (P=0.012) between the ondansetron and metoclopramide groups in terms of the incidence rate of nausea in the recovery room. The incidence of nausea during the first 6 hours after surgery (P=0.17) and throughout the next 6 to 24 hours (P=0.24) was not statistically different between the two groups(33). furthermore In a randomized controlled trial conducted in Iran, the average nausea score at 30 minutes, 60 minutes, 90 minutes, 120 minutes, 2 hours, 4 hours, and 6 hours following surgery in elective cesarean section under spinal anaesthetic was significantly lower than the placebo.(26)

Conclusions

Our investigation in 110 patients experiencing cesarean section under spinal and general anesthesia shows that spinal anesthesia technique achieved better result in the term of reducing the incidence of NV, moreover 4mg I.V of ondansetron significantly related to decrease in intra- and postoperative nausea and vomiting rather than 10 mg of metoclopramide. Furthermore the parturient who need for additional doses were received metoclopramide in contrary with ondansetron during the perioperative period and first two hours in recovery room.

Recommendation

Although nausea and vomiting are extremely infrequently life-threatening, their detrimental impact on patients is sufficient to prompt a conscious search for the best appropriate anesthetic technique and to justify antiemetic therapies in high-risk patient groups. The choice of premedication and intraoperative sedative drugs can have a considerable impact on the incidence of postoperative nausea and vomiting. Both monotherapy and combination therapy with well-known and safe medications are effective for this purpose. Included in an antiemetic regimen are the avoidance of hypotension (vasopressors), proper hydration, and provision of supplemental oxygen. Applying fentanyl or sufentanil as these drugs appear to carry the lowest PONV risk of the opioids in neuraxial anesthesia when it is need. In addition, NSAIDs (and acetaminophen) lowered postoperative opioid intake, postoperative pain, however the incidence of PONV decreased.

ETHICAL APPROVAL

The ethical consideration of the study was examined by the ethical committee of the Tehran university of medical sciences, and ethical approval for the study was obtained (ethical code: IR.TUMS.SPH.REC.1401.200)

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