Magnitude of nausea and or vomiting and its associated factors among mothers taking spinal anesthesia for cesarean section at Gandhi memorial hospital, Addis Ababa, Ethiopia

By – AbereTilahun (BSc in anesthesia)

A thesis submitted to the department of anesthesia, college of medicine & health science, Addis Ababa University in partial fulfillment of the requirements for the MSc in advanced clinical anesthesia

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By – Abere Tilahun (BSc in anesthesia)

Advisor Misrak w/yohannes (Bsc, MSC in anesthesia)

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CERTIFICATION

The undersigned certify that the research entitled Magnitude of nausea and or vomiting and its associated factors among mothers taking spinal anesthesia for cesarean section at Gandhi memorial hospital, Addis Ababa, Ethiopia Institutional based cross sectional study is my original work and any literature and/or data cited in this article were listed in the reference section and any assist done during this period has been given an acknowledgement.

Author

Name _____ Signature _____ Date _____

Approval of the Board of Examiners

1. Advisor

Name _____ Signature _____ Date _____

2. Internal Examiner

Name _____ Signature _____ Date _____

3. External Examiner

Name _____ Signature _____ Date _____

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Acronyms

AAU	Addis Ababa University
AAUECC	Addis Ababa University Ethical Clearance Comity
ASA	American Society of Anesthesiologists
BMI	Body mass index
BP	Blood Pressure
BSc	Bachelor science
CD	Cesarean Delivery
DC	Data Collector
GMH	Gandhi memorial Hospital
IONV	Intraoperative Nausea and Vomiting
IV	Intravenously
MSc	Master of Science
NPO	Non-Per Oral
NSIDS	None steroidal anti-inflammatory dugs
PI	Principal Investigator
PONV	Postoperative Nausea and Vomiting
S	Supervisor
SAB	Subarachnoid Block
Sao2	Arterial Oxygen Saturation
SPSS	Statistical Package for Social Sciences
VAS	Visual analog score

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Abstract

Background: Nausea and vomiting during regional anesthesia for cesarean section are very common and unpleasant events. Can cause significant distress to the patient and interfere with the surgical procedure. Identifying the factors of nausea and or vomiting during cesarean section in specific context can help to reduce negative consequence of nausea and or vomiting during cesarean section delivery.

Objective: The objective of this study was to assess Magnitude of nausea and or vomiting and its associated factors among mothers taking spinal anesthesia for cesarean section at Gandhi memorial hospital, Addis Ababa, Ethiopia

Methods: Institutional based cross sectional study was conducted on 140 obstetric mothers who gave birth under cesarean section with spinal anesthesia at Gandhi memorial hospital from March to May 2017. Systematic random sampling technique was used to select study participants from operation order during arrival. Necessary information was obtained from each mother and medications, producers and vital signs were recorded. Bivariate and multivariate regression analyses were used to identify risk factor for the development of nausea and or vomiting. P value blow 0.05 was considered statistically significant

Result: The overall magnitude of nausea and or vomiting was 54.3 %, Factors associated with postoperative nausea and or vomiting were mothers who did not took metoclopramide prophylaxis (AOR=2.958, 95% CI: (1.084-8.072), long duration of uterus exteriorization (AOR=1.387, CI=1.109-1.734) and intraoperative shivering (AOR=6.133, CI=2.17-17.332) showed strong odds of develop nausea and or vomiting than their counterpart.

Conclusion and recommendation: Nausea and or vomiting among mothers gave birth under cesarean section with spinal anesthesia is significantly high. This study found that mothers who did not took metoclopramide prophylaxis, long duration of uterus exteriorization and intraoperative shivering were factors associated with nausea and or vomiting.

We recommended that metoclopramide prophylaxis should be administered before surgery

Chapter one: Introduction

1.1 Back ground

Neuraxial anesthesia is the preferred method in cesarean section as general anesthesia is associated with airway related adverse outcome, aspiration risk, and intraoperative awareness and increased uterine atony leading to higher blood loss. However, postoperative nausea and vomiting (PONV) is still the most troublesome adverse event encountered in the recovery room. It is also very common occurrence after spinal Anesthesia for Cesarean section, Without antiemetic prophylaxis, the incidence extremely varies from different studies; up to 50-80% which is distressing for both the woman and her family(1-5).

Several mechanisms may be active simultaneously for occurrence of nausea and vomiting during cesarean section under spinal anesthesia, which arises from anesthetic and non-anesthetic causes. Among this Hypotension, occurring during spinal anesthesia for cesarean section during higher segmental and sympathetic blockade and fast administration of IV bolus oxytocin is one of the most important etiological factors for intraoperative NV, which may trigger the vomiting center to induce emesis due to hypoxia (5-6). The rests are increased vagal activity, postoperative pain, and surgical stimuli, bleeding during surgery, uterotonic agents and some antibiotics. (4-6, 10-11, 16-19).

Adequate uterine tone can occur with lower doses of oxytocin (0.5–3) units. A bolus lower dose of oxytocin during caesarean section was resulted in less hemodynamic changes than a 5-unit bolus when given before 10u/hour continuous intravenous infusion of oxytocin (12).
The routine use of 5 units' bolus of oxytocin during cesarean section is no longer recommended (12).

On the other hand, IV administration Ergometrine found to be less hemodynamic instability but can have nausea and vomiting by interaction with dopaminergic and serotoninergic alpha-adrenergic receptor and incidence is highest about 46% with 0.5-mg IV bolus. However, this drug is usually given intramuscularly which may produce less emesis (5).

Different studies also demonstrate the major preventive measures to reduce nausea and vomiting after spinal Anesthesia for cesarean section. which includes; supplemental oxygen, optimal use of neuraxial and systemic opioids and strict control of blood pressure by adequate preloading or co-loading with fluids, administration vasopressors before induction of subarachnoid block and 15 degree left uterine displacement(4,7-9,24,25,27-29).

On the other hand, most studies suggested no single intervention is available to eliminate nausea and vomiting completely during cesarean section under spinal anesthesia; which in fact was relied on the anesthetic and surgical techniques used, relative preventive measures taken and multimodal approaches used for superior results than monotherapy in the presence of multiple risks (4, 20-27).

Many systematic reviews and Meta-analysis and randomized trials have been done in the efficacy of different antiemetic agents for the prophylaxis of intraoperative and postoperative nausea and vomiting when used as monotherapy or in combination (19, 21, 30-33).

Majority of studies done in developed countries showed administration of 10mg metoclopramide prior to spinal blockage was effective and safe to prevent IONV and early PONV in caesarean section under spinal anesthesia (17, 34-35). However, most of these studies were conducted by controlling major intraoperative anesthetic and surgical predisposing factors and excluding known predictor risks of NV.

1.2 Statement of the Problem

The obstetric patients are at high risk of nausea and vomiting due to the physiological changes of pregnancy which can attributed by impaired motility of the esophagus, stomach and small bowel as a result of smooth muscle relaxation fostered by increased levels of hormones; particularly progesterone and the large gravid uterus(3) .

It has been demonstrated in several studies previous history of PONV, female gender, motion sickness, none smoking status, longer duration of surgery and use of IV opioids are the most important predictive factors associated with an increased risk for postoperative nausea and vomiting in the general population. Based on the presences predictor risk factors; if none, one, two, three or four predictor risks present the incidence of PONV were 10, 21, 39, 61 and 79% respectively (13-15).

Intra operative nausea and vomiting interferes with surgical producer, increase operation time, risk of bleeding, wound dehiscence, surgical trauma, risk of aspiration, fluid and electrolyte disturbance and distress to both mother and baby(11).

In Ethiopia, there were a number of studies done on prevalence of post-operative nausea and or vomiting in different way on general population in both general and regional anesthesia and reported the prevalence ranges 36% to 43% among this majority of patients were female.

Preventing and treating nausea and or vomiting in CD require an integrated approach based on identifying the magnitude and addressing the contributing factor. Unlike most government hospitals, obstetric mothers in Gandhi memorial hospital majority of them were emergency referral. This may affect pre-operative intervention time like preload, anti-emetic premedication and reassurance. Here in our set up there are variations in the anesthetic and surgical management during CD in the perioperative period so that the risk of nausea and vomiting expected to be high.

1.3. Justification of the Study

Many studies have been performed to determine the magnitude of nausea and vomiting after spinal anesthesia in general population but not after CD and to find measures for its prevention. Even if the problem was indicated in many literatures, it never been studied in our country and information concerning factors that affect their occurrence is limited. The magnitude of PONV varies from different studies in different countries.

As best of our search, we could not find research about the problem in Ethiopia. So the magnitude of PONV in CD under spinal anesthesia is not known in our situation. Knowing its magnitude and associated factors in our situation helps to recognize the magnitude of the problem and initiates actions to reduce its occurrence. This research can also help as a back ground for future researches on related topic by indicating the magnitude and associated risk factors for PON after CD under spinal anesthesia.

Chapter Two: Literature Review

Nausea and vomiting after spinal anesthesia for caesarean section is multifactorial. And relatively high without prophylactic antiemetic (36).

From one large systematic review reported strategies to prevent rather than treat hypotension was found to be more likely to decrease the incidence of nausea and vomiting.(16) In this regard lateral uterine displacement, fluid co-hydration or preloading with 10- 20ml/kg or 1000-1500ml crystalloids and prophylactic vasopressors have been advocated in order to avoid hypotension(1,24).

However, studies done by Park and his colleagues to compare the effects of varying amounts of crystalloid preload (10, 20 and 30 ml/kg) prior to spinal anesthesia; showed that there were no differences in the incidence of hypotension. On the other hand, studies showed the correlation of hypotension and IONV during spinal anesthesia for cesarean section (21,37).

when the blood pressure dropped more than 20% from baseline the incidence of IONV was 40 to 66%, but was <10% when the blood pressure was maintained at baseline values with infusion ephedrine or phenylephrine. These studies clearly showed that strict control of blood pressure could greatly reduce intraoperative emetic symptoms (37).

As studies showed, the other major contributing factor for the occurrence of IONV is surgical stimuli or inadequate anesthesia, which includes exteriorization of the uterus, intra-abdominal manipulation and peritoneal traction during closure (11-12). These maneuvers produce visceral pain that is mediated by unmylinated C-fibers (38). The incidence is as high as 50%, despite high thoracic sensory block levels (T4-5, 26).

The incidence of post-partum nausea was significantly reduced from 38% to 18% when the uterus was repaired in situ as opposed to after exteriorization and vomiting was also reduced from 18% to 5%, but was statistically insignificant (39).

Use of intrathecal or IV opioids reduces the incidence of both IONV and PONV nausea and vomiting by increasing quality of block and reducing visceral pain during surgical manipulation and postoperative time. (23, 30-41).

On the contrary one previous study found some of the commonly used intrathecal or IV administer of opioids predispose to postoperative nausea and vomiting in a dose dependent manner. (42) But intraoperative opioids were not a statistically significant predictor from multivariate logistic regression of a recent large systematic review study analyses (43).

Systematic review and met analyses done in USA with eleven studies on 702 patients studies showed; administration of 10mg Metoclopramide resulted in a significant reduction in the incidence of ION and IOV when given before block placement [relative risk (RR) (95% CI) =0.27 (0.16, 0.45) and 0.14 (0.03, 0.56), respectively.

The incidence of early (0–4 h) PON and POV [RR (95% CI) =0.47 (0.26, 0.87) and 0.45 (0.21, 0.93), respectively. Overall (0–24 or 4–24 h) PON (RR 0.69; 95% CI 0.52, 0.92) incidence were also reduced with administration of metoclopramide before block placement (17).

Comparative randomized double blind placebo controlled study in USA determine the efficacy and safety of 10mg intravenous metoclopramide administered prophylactically before elective cesarean delivery under spinal anesthesia on 42 patients the result showed significantly lower incidence of nausea and vomiting both before and after delivery than the control group (saline) 14% and 81% respectively (35).

Similar previous study conducted in 60 patients; administration of 10 mg metoclopramide before block placement significantly reduces the incidence of intraoperative nausea and vomiting than placebo (20% vs. 63%). And the corresponding incidence of nausea and vomiting during 0-3 hours after surgery was 27% and 43%; and during 3-24 hours after surgery was 23% and 37% respectively, but it was statistically insignificant to the reduce the incidence of postoperative emesis(44) .

Similar study done in India with 80 patients to compare effects of metoclopramide and other two antiemetic drugs in the control of PONV showed that the incidence of nausea and vomiting intraoperative and up to 4 hours postoperative was 30% in the metoclopramide group and 55% in saline group but the result was statistically insignificant(44).

A randomized clinical trial study aimed to compare the effects of Acupressure and Metoclopramide on postoperative nausea and vomiting was done102 patients in Caesarean Sections. This study found the incidence of nausea (50% vs. 20%; p=0.03 with 95%CI) and vomiting (32.34%vs 11.76%; p value of 0.01) in 6hours postoperative periods was significantly lower in Metoclopramide group as compared that in the control group. And the mean severity of nausea within 6 hours after surgery was significantly reduce with metoclopramide compared with control groups(45).

2.1 conceptual frame work

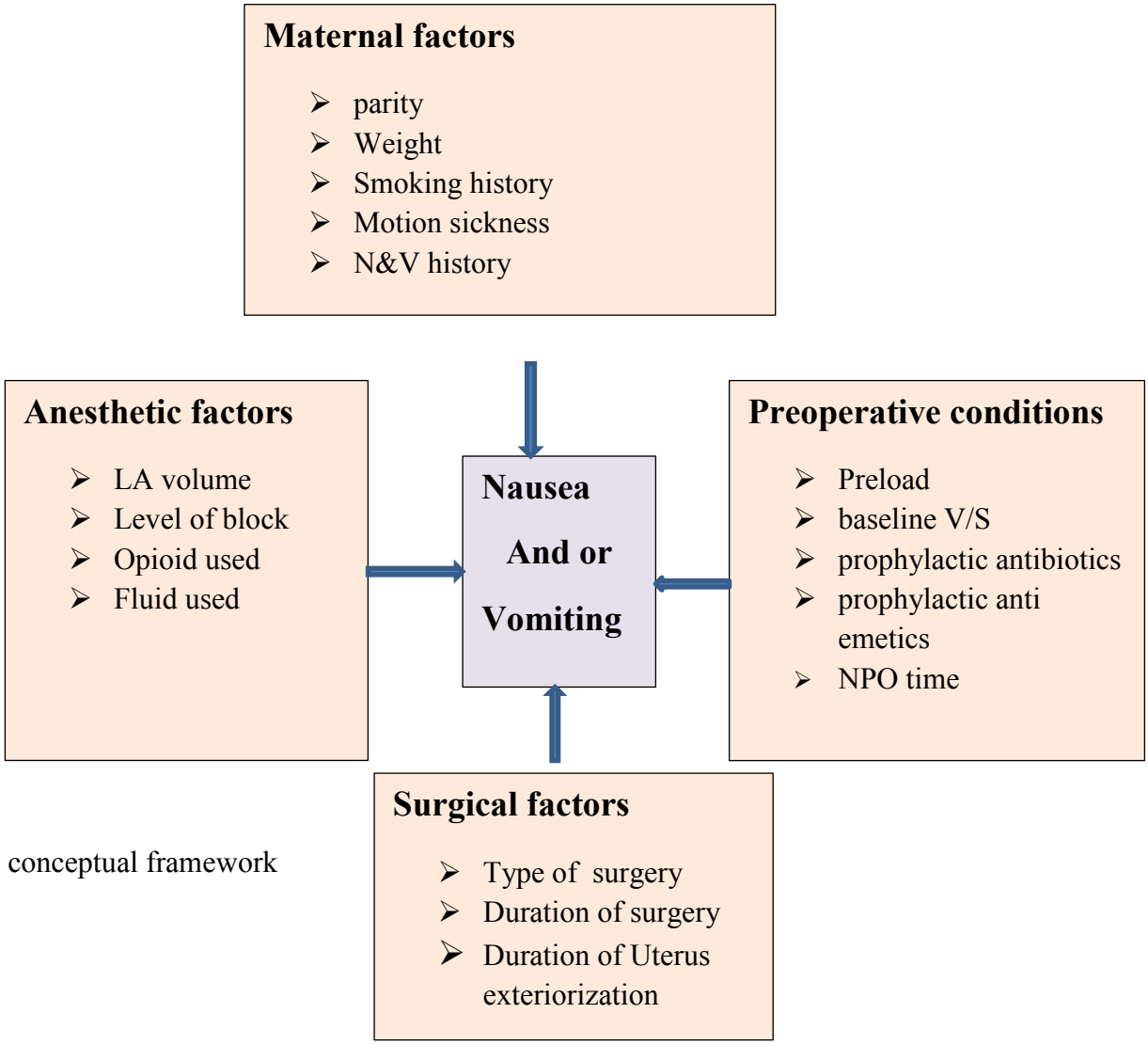

Fig 1: conceptual framework

Chapter Three: Objectives

3.1. General Objective

To assess magnitude and associated factors for nausea and or vomiting following cesarean section under spinal anesthesia at Gandhi memorial hospital from March 15 to May 15, 2017.

3.2. Specific objectives

To determine magnitude of nausea and or vomiting among mothers who take spinal anesthesia for cesarean section in Gandhi memorial hospital.

To identify associated factors for intraoperative and postoperative nausea and vomiting following spinal anesthesia for cesarean section.

Chapter Four: Methodology

4.1. Study Design and Period

An institutional based cross sectional study was conducted at Gandhi memorial hospital from March 01 to May 01, 2017.

4.2 Study area

This study was conducted at Gandhi memorial hospital, which is one of the Governmental Hospitals in Addis Ababa under Addis Ababa Health bureau in kirkos sub city. It provides obstetrics services for over 2000 women annually besides other Health services and they were using spinal anesthesia more frequently than General anesthesia for caesarean section.

4.3. Source and study Population

4.3.1. Source population

The Study populations were all mothers who gave birth under caesarean section with spinal Anesthesia in Gandhi Memorial Hospital.

4.3.2 Study Population

The Study populations were all mothers who gave birth under caesarean section with spinal Anesthesia during the Study period in Gandhi Memorial Hospital.

4.4. Inclusion and Exclusion Criteria

4.4.1. Inclusion criteria

All mothers planned to have caesarean section under spinal anesthesia with available local anesthetics were included in the study.

4.4.2. Exclusion criteria

- ✓ Any mother having acute or chronic medical illness associated with nausea and vomiting
- ✓ Mother who were received antiemetic medication within 24 hours before surgery as a treatment

4.5. Variables

4.5.1. Dependent variable

Nausea and/or vomiting

4.5.2. Independent variables

Demographic factors like age, weight, height, ASA status, parity, previous history of PONV or motion sickness and history of smoking status.

Anesthetic and surgical management: perioperative medications such as opioids, uterotonic agents, and NSAIDS and amount of fluid preloaded, total intraoperative, volume of local anesthetics administered and level of sensory block, duration and type of surgery/uterus exteriorized, hemodynamic changes (BP, PR, Sao2) after spinal anesthesia and intraoperative administration of vasopressors and supplemental oxygen.

4.6. Operational Definitions

To say the patient has nausea and vomiting following cesarean section under spinal anesthesia,

A patient must have at least one episode of nausea and/or vomiting in the intraoperative and early postoperative period.

The decrease in systolic blood pressure >= 20% of baseline values and/ after spinal injection will be considered as hypotension.

Amount of fluid preloaded = Amount of intravenous fluid given within 30 minutes before block placement.

Total intraoperative fluid given = total amount of intravenous fluid given between spinal tap and end of operation.

Duration of uterus exteriorized = the time when the uterus lifted out of the abdominal cavity during uterine repair for> 5minute

Shivering: muscular activity in one or more muscle groups

4.7. Sample size determination and Sampling Technique

4.7.1. Sample size determination

The sample size was calculated using the single population proportion formula;

$$n = (Z_{a/2})^2 \times p*q / d^2 = \frac{(1.96)^2 \times (0.5)(0.5)}{(0.05)^2} = 384$$

Where:

n= number of sample size.

Z= desired 95% confidence, Z=1.96.

p = 0.5 maximum population proportion, since no previous studies found.

q =1-*p = 1-0.5=0.5*

d = is the margin of sampling error tolerated (5%)

By using correction formula for finite population since source population is less than 10,000.

$$n = \frac{n}{\frac{n}{N}+1}$$

Where n= the sample size = 384

N = Total No of mothers who were undergo cesarean section = 200(from situational analysis)

nf = $_{f=}$ Final sample study

nf = 384/(384/200+1) = 132

Mean of midyear population was used to get total number of patients who were undergo cesarean section in 2 months. The midyear population from situational analysis was 600. So, the size of population in 2 months is 600 divided by 3 gives 200. Thus, the final sample size (n final +5% contingency) was 140.

4.7.2. Sampling Technique

Systemic random sampling technique was used to select study participants from operation schedule by using skip interval of K = N/n =2.

Where n = total sample size, K = skip interval, N = Total study population

The first study participant was selected by lottery method

4.8. Data Collection

The data collection procedure was including prospective observation checklist and interview-based questionnaire. The perioperative anesthetic and surgical managements were continuously observed by data collector free from the intraoperative anesthesia management. Oxygen saturation, pulse rate and systolic blood pressure of each woman will be monitored and recorded every 5 minutes during the surgery and post-operatively every 30 minutes during the study period.

One of data collector observed fluid used to preloading or co loading and anesthetic and surgical interventions during spinal anesthesia in operation theatre.

For the interview, a structured questionnaire was developed for the patient on identifying nausea and vomiting during operation and up to first 60 minute. Each patient was observed and asked for the intra-operative and early postoperative time of occurrence, severity and number of episodes NV by another trained data collector in the obstetrics recovery. Patients were asked to score the NV experience based on Visual analogue scale (VAS) after the end of operation to one hour postoperative in each interval. (See ANNEX II).

4.9. Data Quality Control

To ensure quality of data, pre-test of the data collection tool (the questionnaire) were done on 14 patients at kidus poulos hospital who were not be included in the main study and the collected data were checked out for the completeness, accuracy and clarity. Then necessary correction was done accordingly on the questionnaire for the main study.

4.10. Data Analyzing and processing

After completion of data collection, the data was manually checked for errors; and entered into epi-info7 and exported to SPSS version 20 for analysis.

Descriptive statistics was used to summarize data, tables and figures for display results. Bivariate and multivariate analysis were used to see the effect of independent variable on outcome variable. Variables, which are significant on bivariate analysis at p-value less than or equals to 0.25 were taken to multivariate analysis.

In multivariate analysis, P- value of less than or equals to 0.05 was used as a cut of point for presence of association. Strength of association was measured by 95% confidence interval and/ Odd ratio.

4.11. Ethical considerations

Ethical clearance was obtained from the university ethical clearance committee before the start of the study. The purposes and the importance of the study was explained & verbal informed consent was obtained from each participant by the data collector. Confidentiality was maintained at all levels of the study by avoiding identifiers and using codes to identify patients. Participant's involvement in the study were on voluntary bases, participants who were willing to participate in the study & those who wish to quit their participation at any stage was informed to do so without any restriction

4.12 Dissemination of Results

The research will be presented for the entire department of anesthesia stuffs including 4th year students and first year Msc anesthesia student. It will also presented on the14thEAA annual conference; the research will be submitted to journals for publication

Chapter Five: Results

5.1 Socio-demographic, Preoperative patient's characteristics and medication

One hundred forty mothers with 100% response rate were included in this study. The age of mothers ranged from 20 to 42 years with a median age of 28 years. The modal age group was 25-29 years.

Table 1: Socio-demographic & premedication characteristics of mothers Gandhi memorial hospital, 2017 (N=140).

Variable	Frequency	Percentages
Age		
20-24	37	26
25-29	56	40
30-34	30	21.4
35-39	16	11.4
40-44	1	0.7
Weight		
50-69	78	55.7
70-89	57	40.7
90-110	5	3.6
ASA status		
ASAI	133	95
ASAII	7	5
Parity		
Para0	12	8.6
para1	51	36.4
para2	63	45
para3	9	6.4
para4	3	2.1
para5	2	1.4
Smoking history		
Yes	1	0.7
No	139	99.3
PONV History	40	28.6
Motion sickness	7	5
Metoclopramide		
Yes	100	
No	40	71.4
Ceftriaxone	80	57.1
Oxytocin	94	67.1

5.2 Proportion and predictors of postoperative nausea and or vomiting

In this particular study, based on the sampling method, 140 mothers were selected to be participated and interestingly the response rate was 100%. Meanwhile, among the study participants, Majority (n=76 or 54%) had an experience of nausea and or vomiting and among the total occurrences (n=76) the large proportion (80.3%) took by the during operation and the rest (19.7%) were during post-operative

Mothers who gave birth under emergency C/S were experience more nausea and or vomiting than mothers who gave birth under elective C/S 66.67% vs. (32.61)) respectively.

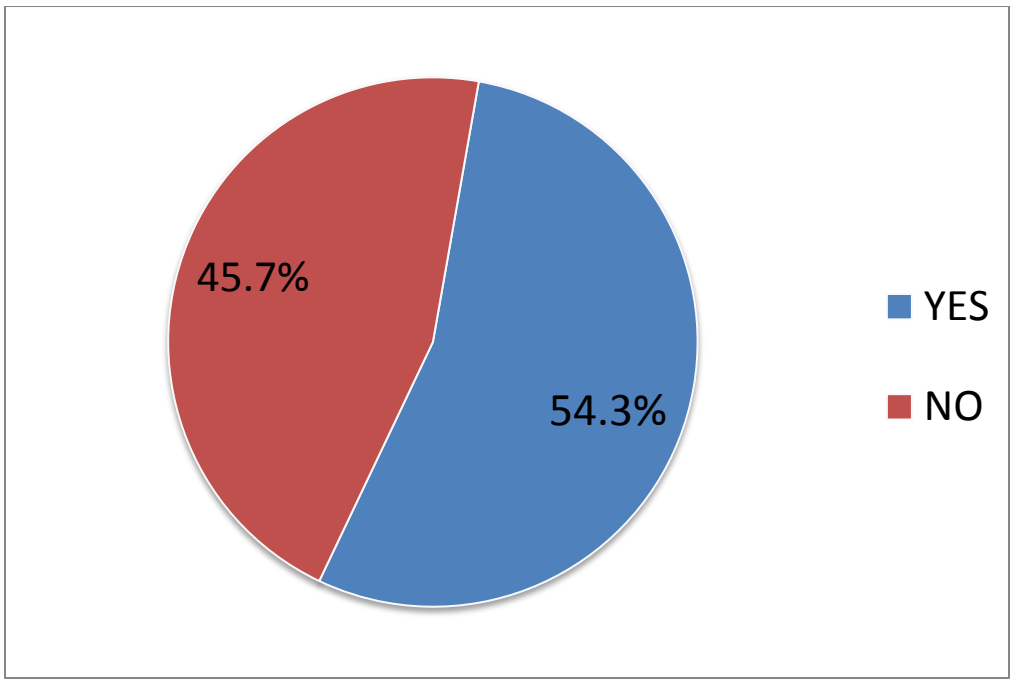

Figure2: Proportion of mothers who developed nausea and or vomiting in Gandhi memorial Hospital from March 16 to May 16, 2017

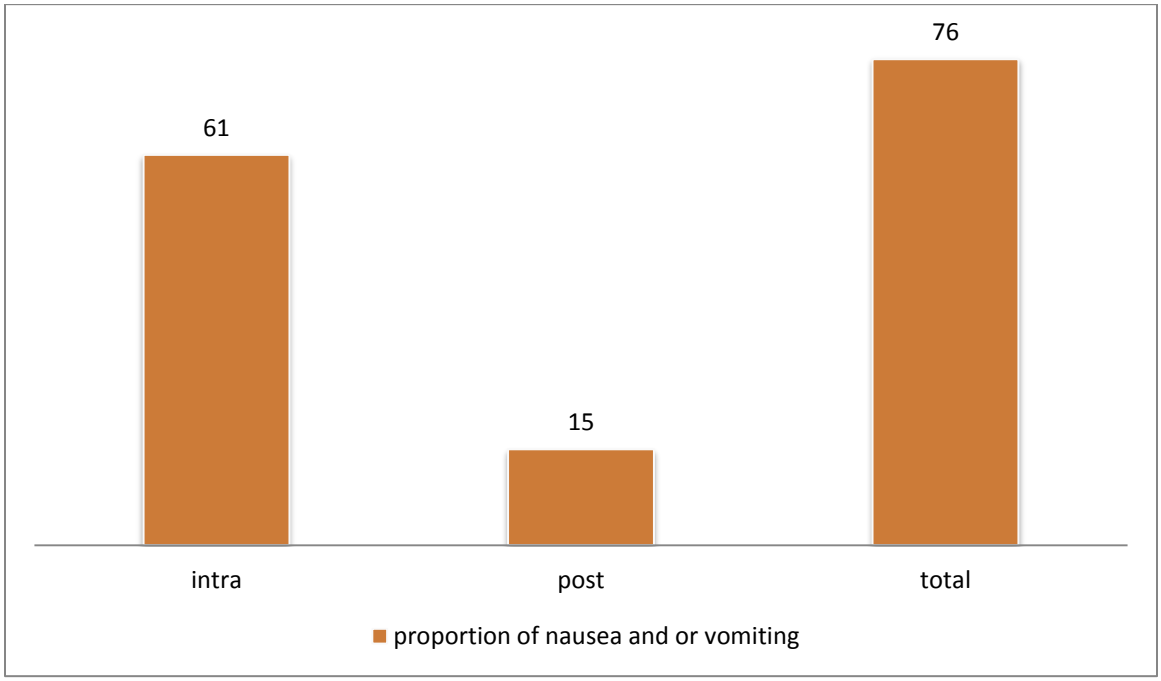

Figure 3 **:** Proportion of nausea and or vomiting in time pattern Gandhi memorial hospital from March 16 to May 16, 2017.

5.3 Occurrence hypotension for first 60 minute

Table 2 shows the relationship between hypotension and experience of nausea and vomiting . Occurrence of hypotension has no significant associations in bivariate analysis with nausea and or vomiting after spinal anesthesia.

Table2 the relationship between experience of nausea and results of bivariate logistic regression analysis on hypotension, Gandhi memorial hospital, 2017 (N=140).

Hypotension for first 60 minute	Nausea and or Vomiting		
	YES	NO	P value
At 05 minute			
YES	2(66.7%)	1(43.3%)	0.667
NO	74(54%)	63(46%)	
At 10 minute			
YES	4(21.1%)	15(78.9%)	0.28
NO	72(59.5%)	49(40.5%)	
At 15 minute			
YES	24(52.2%)	22(47.8%)	0.284
NO	54(57.4%)	40(42.6%)	
At 20 minute			
YES	30(48.4%)	32(51.6%)	0.572
NO	44(56.4%)	34(43.6%)	
At 30 minute			
YES	38(64.4%)	21(35.6%)	0.41
NO	38(46.9%)	43(53.1%)	
At 60 minute			
YES	27(60%)	18(40%)	0.35
NO	49(51.6)	46(48.4%)	

5.4 The variables or risk factors influencing nausea and or vomiting after spinal anesthesia for c/s delivery

The analysis results shown in table 3, reveal that the relationship between experience of nausea and or vomiting and each of these factors was seen to be significant (P≤0.25) in bivariate analysis. Those variables, (P>0.25) are not included in table.

Table3, The variables or risk factors influencing nausea and or vomiting Gandhi memorial hospital, 2017

Variable	Nausea and or Vomiting		
	Yes	no	P
Metoclopramide n(%)			<.001
YES	45(45%)	55(55%)	
NO	**31(77.5)**	**9(22.5%)**	
Oxytocin infusion before OR			0.001
YES	53(69.7%)	23(30.3%)	
NO	27(42.2%)	37(57.8)	
Anti-biotic			0.151
ceftriaxone	55(58.5%)	39(41.5%)	
Ampicillin	21(45.7%0)	25(54.3%)	
Type of surgery			<.001
Emergency	62(66%)	32(34%)	
Elective	14(30.4%)	32(69.6%)	
Intra op shivering			<0.001
Yes	55(74.3%)	19(25.7%)	
No	21(31.8%)	45(68.2%)	
Supplemental oxygen			0.002
Yes	10(30.3%)	23(69.7%)	
No	66(61.7%)	41(38.3)	
uterus exteriorization			<0.001
<=5 minute	14(31.1%)	31(68.9%)	
>5minute	62(65.3%)	33(34.7%)	

5.4.1 Factors associated with postoperative nausea and vomiting

Factors that were significantly (P value< 0.05) associated with nausea and or vomiting, following multivariate analysis were long duration of Uterus exteriorization (AOR=1.387, CI=1.109-1.734), No metoclopramide was given (AOR=2.958,CI=1.084-8.072) and Intra op shivering (AOR=6.133, CI=2.17-17.332)).

Table4 Factors associated with postoperative nausea and or vomiting: results of bivariate and multivariate logistic regression analysis, Gandhi memorial hospital, 2017 (N=140).

Variable				AOR	95% CI for AOR	P value
	COR	95% CI for OR	p value			
Without metoclopramide	4.21	1.817-9.754	0.001	2.958	1.084-8.072	0.034
Oxytocin infusion before OR	3.158	1.573-6.339	0.001	0.812	0.246-2.685	0.773*
emergency surgery	4.429	2.073-9.462	0.001	3.332	0.912-12.170	0.069*
Uterus exteriorization time>5minute	1.306	1.093-1.561	0.003	1.387	1.109-1.734	0.004
Intra op shivering	6.203	2.974-12.937	0.001	6.133	2.17-17.332	0.001
Oxygen supplements	3.702	1.601-8.563	0.002	1.151	0.63-3.652	0.811*

NB: *= not significant, AOR=adjusted odd ratio, CI= confidence interval, COR= crude odd ratio

Chapter Six: Discussion

Post-operative nausea and or vomiting are a long-standing problem, not a new concept in anesthesia. Despite plenty of studies over the past few decades, PONV remains an extremely significant challenge in obstetric due to its complex mechanism, resulting in serious consequences. Therefore knowing its magnitude is help full to design effective way to prevent or arrest PONV is urgently needed as ever.

This present study indicates that, experienced with nausea and or vomiting among 140 mothers, was (54.3%). This was the same result with A comparative prospective study conducted in Zahedan University of medical sciences on 80 full term women find that frequency of intraoperative nausea and vomiting was 52.5%(44) and also Without antiemetic prophylaxis, the incidence extremely varies from different studies; up to 50-80%.while in non-obstetric operations, this rate ranges from 7% to 42%. (2-5). this condition is affected by factors that are particular to the patient, anesthesia, surgery and mothers with pregnancy are considered to have increased sensitivity to hormonal changes along with neurotransmitter abnormalities(7).

The results of this study showed that the proportion of nausea and or vomiting is higher during operation than early post operation: (43.6%vs10.7%). This was also similar in time pattern with Tarhan et al. Their study showed that the incidence of nausea is higher in the beginning of the operation: 53.3% nausea before delivery versus 10% nausea after operation. Causes for the high incidence of NV intra op than post op may be intraoperative hypotension, reduced cardiac output due to vena cava compression, uterotonic drugs such as oxytocin and particularly Ergometrine, exteriorization and manipulation of the uterus, intestines, and peritoneum, as well as psychological distress, although underlying path mechanisms are not fully understood in all details (4-6,10,11,16-19).

This study demonstrates that, administration of 10 mg metoclopramide before block significantly reduces the occurrence of intraoperative nausea and or vomiting than without ((45%) vs.(77.5). This finding is also confirmed by a comparative randomized double study done in USA and India on 42, 60, mother respectively. Their result showed that metoclopramide had a

significantly lower incidence of nausea and vomiting both before and after delivery than the control group (saline) 14% and 81%,(20% vs. 63%). respectively (17,35,44)

.

This decrement is due to use of metoclopramide, which is a central and peripheral D2 antagonist and sensitizes tissues to acetylcholine, believed to improve symptoms by increasing lower esophageal sphincter pressure and increasing gastric transit. It also corrects gastric dysrhythmias by stimulating antral contractions and promoting antroduodenal contractions (3).

The present study found that the proportion of nausea and or vomiting was significantly reduced from 65.3% to 31.1% when the uterus was repaired in side. This finding was confirmed in research done by Siddiqui M ital. their result showed that the incidence of nausea was significantly reduced from 38% to 18% when the uterus was repaired in situ this is due to exteriorization of the uterus, intra-abdominal manipulation or exploration, and peritoneal traction during uterine repair and abdominal closure can cause pain or discomfort. Visceral pain, carried by the unmyelinated C-fibers, is typically poorly localized, dull and deep, and is a potent stimulus for intraoperative nausea and vomiting (38, 39).

In our study, the proportion of shivering with nausea and or vomiting was 74.3%. This result is higher than a randomized double-blinded clinical trial study conducted in Tehran University of Medical Sciences, on Efficacy of granisetron on prevention of shivering, nausea and vomiting during cesarean delivery under spinal anesthesia showed that the incidence of shivering and nausea and vomiting in saline group were 54% and 60% respectively. This difference may be due to the study designed above study was randomized double-blinded clinical trial this control other confounders (48).

Previous studies have shown that being non-smoker results in more susceptibility to intra operative nausea and vomiting, but this finding was not confirmed in our study due to smaller number of smokers in the sample only one smoker .(1, 2,21)

Multiple factors can cause nausea and vomiting during spinal anesthesia for caesarean delivery. Hypotension may cause brain stem hypo perfusion, thus triggering emesis. Some authors recommended the prophylactic infusion of ephedrine for prevention of maternal hypotension (5-6, 12). In our study, rapid fluid infusion for almost all mothers but in few mothers loaded with addition of infusion of adrenaline for the prevention of maternal hypotension. In addition, we found a low proportion of hypotension, which was not associated with nausea and or vomiting. Therefore, the presence of emetic symptoms during caesarean section under spinal anesthesia can be due to the long duration of uterus exteriorization, mesenteric manipulations and drugs administered like oxytocin infusion.

6.1 limitation

In this study, we examined some potential factors, including the medical history, medication in the operating room, and anesthetic and surgical techniques that may play a role in the occurrence of nausea and or vomiting during caesarean section under spinal anesthesia. Our study was cross sectional in one institution, which should ideally be multi center where the large sample size could be included. This, alongside the relatively modest sample size may throw shadow on the reliability of the results.

Chapter Seven: Conclusion and recommendation

7.1: Conclusion

In this study, the magnitude of nausea and or vomiting among mothers taking spinal anesthesia for cesarean section was significantly high, 54.3%, among this, 43.6% happened intraoperative and the res 10.7% were in early post-operative time. Intra operative shivering and duration of uterus exteriorization were significantly a risk factor for development of nausea and or vomiting in mothers taking spinal anesthesia fore C/S.

In the other, hand our data shows that intra- and postoperative nausea and or vomiting can be significantly reduced by an anti-emetic prophylaxis 10mg metoclopramide IV administration.

7.2: Recommendation

By taking in to account the result of this study, the following recommendations are forwarded

As nausea and or vomiting is one of the most distressing and unpleasant complication during cesarean delivery .this need series preventive and treatment.

Midwifes

Use preventive measures by giving prophylactic antiemetic like metoclopramide and others

Prevent shivering by prevent and treat perioperative hypothermia using physical or pharmacological method like warming rooms, giving warmed iv fluid, oxytocin infusion other than bolus.

Anesthetists

Beside preventive method listed above improving the quality of block analgesia.

Surgeons

Do uterine repair in situ; perform assisted delivery of the placenta and minimizing surgical stimuli where possible.

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Annex I: Information Sheet

Title of the Research Project

Magnitude of nausea and or vomiting and its associated factors among mothers taking spinal anesthesia for cesarean section at Gandhi memorial hospital, Addis Ababa, Ethiopia

Name of Principal Investigator – Abere Tilahun(BSc in Anesthesia)

Name of advisors: Misrak(MSc)

Name of the Organization: Addis Ababa University, College of Medicine and Health Sciences, Department of Anesthesia

Name of the Sponsor: Addis Ababa University

Introduction:

This information sheet is prepared with the aim of assessing Incidence and associated risk factors of intraoperative and early postoperative nausea and vomiting following cesarean section under spinal anesthesia in GMH. The research group includes the principal investigator two data collectors, and one advisor.

Purpose of the Research Project

The aim of this study was to determine Incidence and associated risk factors of nausea and vomiting following cesarean section under spinal anesthesia in GMH. Assessing

The Incidence and associated risk factors for nausea and vomiting in patients during cesarean section under spinal anesthesia was very important to reduce the severity of nausea and vomiting during cesarean section under spinal anesthesia by avoiding the risk factors and giving appropriate prophylaxis or other preventive measures. The results of this study will be used to design appropriate intervention programs to reduce the occurrence of intraoperative and postoperative nausea and vomiting GMH, as well as in other health institutions in Ethiopia.

Person to contact

For any questions or concerns can contact the principal investigator using the following addresses:

Name: AbereTilahun

Telephone: +251 920 442222

E-mail:aberet2005@gmail.com

Annex – II: English Questionnaire

This questionnaire was used as a guide to collect information for the data collectors!
Questionnaires to assess Incidence and associated risk factors of intraoperative and 6 hours post-operative nausea and vomiting during cesarean section under spinal anesthesia in GMH, Addis Ababa Ethiopia.
Hello! My name is ----------I am one of the members of the research team. The purpose of this questionnaire is to gather information on Incidence and associated risk factors of intraoperative and post-operative nausea and vomiting during cesarean section under spinal anesthesia in GMH. I have identified you as a study participant hoping that you would be willing to help me by providing some information. I have some questions, which I would like to ask you, if you have the time and are willing. Your participation is definitely important to assess the Incidence and associated risk factors for nausea and vomiting following cesarean delivery under spinal anesthesia in GMH. All information you provide will be kept confidential. I will not include any identifiers, such as your name or exact address. Only honest answers would contribute to improvement of health planning. Your role in the success of the research is important and I appreciate your contribution to the research. Would this be okay with you?
I understood about the advantage of the research and the roles I will have in the research. I have agreed to participate in the research.

A. Agree B. disagree

If Respondent agrees to be interviewed, the interview will be started
Questionnaire Code _____
Starting time _____ finishing time _____
Date of data collection_____
Name of data collector _____signature_____

Annex– III: Amharic Version Questionnaire Consent Form

ጤና ይስጥልኝ፡ ስሜ ……..ይባላል፡፡ በአዲስ አበባ ዩኒቨርሲቲ አንስቴዝያ ትምህርት ክፍል የምርምር ቡድን ውስጥ እየሰራሁ እገኛለሁ፡፡ ወደዚህ የመጣሁበት ምክንያት ከወገብ በታች በቀዶ ህክምና የሚሰጥ አኔስቴሽያን ተከትሎ ሊከሰት ስለሚችል የማቅለሽለሽ እና ትውኪያ መጠን ለሚደረገው ምርምር /ጥናት መረጃ ለመሰብሰብ ነው፡፡ ጥናቱን የሚያካሂዱት በአዲስአበባ ዩኒቨርስቲ አኔስቴዝያ ት/ክፍል የሁለተኛ ድግሪ ተማሪ የሆኑት አበረ ጥላሁን ናቸው፡፡

ስለዚህ ከአስር እስከ ሀያ ደቂቃ የሚሆን ጊዜ የሚወስዱ ጥያቄዎች አሉኝ፡፡ የርስዎ ጥያቄዎችን መመለስ ከወገብ በታች አኔስቴዥያ ተሰጥተዎት በቀዶ ህክምና ሲወልዱ ሊከሰት ስለሚችል ማቅለሽለሽ እና ትውኪያ ለመቀነስና ለመከላከል ከፍተኛ የሆነ አስተዋፅዎ ይኖረዋል፡፡ ከዚህ የሚገኘው ማንኛውም መረጃ በሚስጥር ይጠበቃል፡፡ ለዚህም ሲባል የርስዎ ስም አይፃፍም፡፡ ለመመለስ ፈቃደኛ ያልሆኑትን ማንኛውም ጥያቄ አለመመለስም ይችላሉ፡፡ በማንኛውም ስዓት የጥያቄና መልሱን ሂደት ማቋረጥ ይችላሉ፡፡ ነገር ግን ቀደምሲል እንደተገለፀው እርስዎ የሚሰጡት እዉነተኛ ምላሽ ከወገብ በታች በቀዶ ህክምና የሚሰጥ አኔስቴዥያን ተከትሎ ሊከሰት ስለሚችል የማቅለሽለሽ እና ትውኪያን ለመቀነስና ለመከላከል ለሚደረገዉ ምርምር / ጥናት በከፍተኛ ሁኔታ ያግዛል፡፡

<u>የቃል ስምምነት</u>

የዚህ ጥናት ዓላማ ተነቦልኝ (አንብቤው) እና አላመው ገብቶኝ በጥናቱ ለመሳተፍ

ሀ. ፈቃደኛ ሆኛለሁ---------- (ቃለ መጠይቁን መቀጠል ይችላሉ)

ለ. ፈቃደኛ አይደለሁም……..(ቃለ መጠይቁን ያቁሙ)

ፈቃደኛ ከሆኑ

የጥያቄው መለያ ቁጥር …….. መጠይቁ የሚካሄድበት ቀን---------- የተጀመረበት ስአት……

የጠያቂው ስምና ፊርማ---------- ----------

የሱፐርቫይዘር ስምና ፊርማ---------- ----------

Annex– IV: Questioners

Instruction: For each of the following questions, please circle the number of alternative(s) that fit the response or fill the blank space!

SECTION I: maternal characteristics and predictor associated factors

S.No	Questions	response
101	maternal age in years	_____
102	Maternal Weight in kg	_____
103	Maternal ASA physical status	A. ASA I C. ASA III B. ASA II D. ASA IV
104	Maternal Height in cm	_____
105	parity	_____
106	Indication for cesarean section specify	_____
107	Did the mother have smoking history?	A. Yes B. No
108	Did the mother Have history of surgery and anesthesia?	A. Yes B. No
109	If yes; Did the mother have nausea and or vomiting postoperatively?	A. Yes B. No
110	Did the mother Have hx of nausea or vomiting while travelling by car	A. Yes B. No

SECTION II: baseline preoperative characteristics of patients and interventions

S.No	Questions	response
201	10 mg plasil is given	A. yes B. no
202	Did the mother on oxytocin infusion before C/S	A. Yes B. No

203	What was prophylactic antibiotic given?	A. Ampicillin B. Ceftriaxone C. Others_____specify
204	Amount of fluid preloaded within 30 minutes before spinal block in ml	_____
205	Fasting hours before cesarean section?	A. less than 6 hours B. greater than 6 hours
206	Base line BP before SAB in OR in mmHg	_____ _____
207	Base line PR before SAB in OR in bpm	_____

Section III: intraoperative anesthetic and surgical interventions**.**

S.No.	**questions**	**response**
301	What was local anesthetic	A lidocaine 5% have B bupivacaine 0.5% isobaric
302	Volume of local anesthetic in ml	_____
303	Sensory block level before delivery in terms of dermatome level	_____
304	Did the mother complain pain during surgery	A. yes B. no
305	If, yes Dose intravenous supplemental analgesia was given?	A. yes B. no
306	If yes, what is given(total doses intraoperative period)	A morphine _____mg B fentanyl _____mg

		C tramadol _____mg D diclofenac _____mg E pethidne _____mg
307	Does left lateral tilt or 15 degree manually uterine displaced?	A. yes B. no
308	Total amount blood loss during surgery in ml	_____
309	Total intraoperative fluid given during the operation in ml	_____ _____
310	Which fluid was given?	A. Normal saline B. Ringer lactate
311	Type of surgery	A. Emergency B. Elective
312	Duration of surgery in minutes	_____
313	Duration of uterus exteriorized in minute	_____
314	What type of uterotonic agent was administered after delivery?	A. Oxytocin bolus _____ IU B. Oxytocin infusion _____IU C. Ergometrine_____mg(iv/im,)
315	Does patient experience shivering after spinal anesthesia	A. yes B. no
316	Does supplemental oxygen given during the operation?	A yes B no

SectionIV: Hemodynamic measurements during surgery and 1 hour postoperative

S.No.	questions	response
401	SBP (mmHg) at 5, 10, 15, 20, 30,40 minutes	___, ___, ___, ,___, _____, _____
402	PR at 5, 10, 15, 20, 30 minutes after SAB.	_____ , _____ , _____ , _____ ,_____, _____
403	Sao2 at 5, 10, 15, 20, 30 minutes after SAB	_____, _____,_____,_____,_____%
404	Was to treatment given for HPT or bradycardia?	A. yes B. no
405	if yes ; what was given	A. adrenaline B. atropine C. dopamine D. others _____specify
406	BP every 1hour interval	_____,_____,_____,_____,_____,_____mmHg
407	PR every 1hour interval	_____ , _____ ,_____, _____ , _____

Section V: The experiences of nausea and or vomiting in the intraoperative period, early postoperative period (0-1 hour).

S.Nos.	questions	response
501	Did you experiences nausea and or vomiting following spinal anesthesia?	A. yes B. no
502	If yes, when it was happened?(follow Q503 to 506)	A. during operation B. early postop (0-1hour)