



Effect of Pre-and Intraoperative Anxiety on Nausea and Vomiting during Spinal Anaesthesia in Cesarean Section Patients in a Hospital in Hamadan, Iran, in 2016

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Abstract

Background and Objective: Nausea and vomiting are two of the most common complications after spinal anesthesia that may be affected by anxiety in the patient. It may cause patient dissatisfaction, delay post-anesthetic care unit (PACU) discharge, prolong hospital stay, and increase the cost of hospitalization as a result. Therefore, this study aimed to determine the effect of preoperative and intraoperative anxiety on vomiting and nausea caused by spinal anesthesia in cesarean.

Materials and Methods: This cross-sectional study was carried out using the purposive sampling method on 100 patients who were referred to Fatemeh Hospital of Hamadan, Iran, in 2016. Spielberger questionnaire and Visual Analogue Scale were used to assess preoperative and intraoperative anxiety, respectively. Nausea and vomiting were assessed during the intraoperative period and in the recovery room. Data were analyzed using SPSS software (version 18) through Chi-square and independent sample t-test.

Results: The results showed that there were no significant differences between patients with and without vomiting in terms of preoperative state, trait anxiety, and intraoperative anxiety level. However, significant differences were observed between patients with and without nausea in terms of preoperative trait anxiety ($P \leq 0.05$).

Conclusions: Based on the obtained results, nausea in patients can be influenced by their anxiety. Therefore, attention to the anxiety in patients and reduction of this anxiety can reduce nausea in these patients.

Keywords: Intraoperative anxiety, Nausea, Preoperative anxiety, Vomiting



Background

Preoperative anxiety is a common and prevalent phenomenon in most patients undergoing the surgery [1] and it is a problem associated with preoperative care in patients. People usually experience high levels of anxiety during the first surgical experience [2]. The main causes of preoperative anxiety include the possibility of delay in surgery (69.6%), worry about surgical mistakes and injuries to patients (64%), lack of attention from the staff (63.2%), and fear of anesthesia complications (58.4%) [3].

The prevalence of anxiety is different depending on the type of surgery; however, it is reported to be from 60% to 92% in patients with non-selective or emergency surgery [4-5]. The problems associated with preoperative anxiety in patients include increased dosage of drugs for induction of post-

operative anesthesia and anti-pain [6], difficulty in accessing the vein, increased pain intensity, postoperative nausea and vomiting, long stay in recovery, and an increased risk of infection [7-9].

Cesarean section is a highly prevalent surgery that is mostly performed with the help of spinal or epidural anesthesia. Spinal anesthesia is commonly used in the cesarean section [10-11]. Spinal anesthesia is the most important and common causes of nausea and vomiting and are exacerbated by hypotension, visceral manipulation, vagal stimulation, intravenous drug use, and psychosocial factors [12]. Postoperative nausea and vomiting are the most common post-surgical complications after pain and hypotension in the cesarean section and are observed in more than 66% of patients in spinal cesarean section [2]. This disorder causes

dehydration, water and electrolyte imbalance, stomach contents aspiration, pain in the operation site, impairment of recovery, increased cost of treatment, and patient dissatisfaction [13].

Preoperative anxiety is a factor influencing postoperative nausea and vomiting [13-15]. Anxiety makes the patients susceptible to postoperative nausea and vomit by decreasing the pH of stomach content and increasing its volume [16-17]. Even though the relationship between preoperative anxiety and postoperative nausea and vomiting has been investigated in some studies such as that conducted by Ghanei Gheshlagh et al. [18], the effect of anxiety on patients' nausea and vomiting has been less considered in terms of such aspects as patients' anxiety type (in terms of state and trait anxiety) and anxiety before or after surgery.

The best and most appropriate treatment for nausea and vomit complications can prevent more severe complications since these can affect maternal and fetal health and cause complications, such as increased hospital stay and costs, as well as patient discomfort and dissatisfaction. Therefore, the present study can contribute to the development of useful therapeutic protocols for patients.

Objectives

The present study aimed to investigate the impact of anxiety on nausea and vomiting caused by spinal anesthesia before and during the cesarean section.

Materials and Methods

The present descriptive-analytical study was conducted on 100 candidate patients undergoing cesarean section at Fatemeh Hospital in Hamedan, Iran, in the summer of 2016. Patients were selected using a convenience sampling approach. The inclusion criteria included pregnant women in the age range of 18-45 years who volunteered for a cesarean section; willingness to participate in the study along with reading and writing ability; physical status 1 or 2 according to the American Society of Anesthesiologists; and the willingness to undergo spinal anesthesia.

However, those with a history of nausea, vomiting, motion sickness, psychiatric illnesses, and smoking and drug addiction were excluded from the study.

Initially, the researchers explained the process of the study to the participants. Afterward, the participants were asked to complete questionnaires after written informed consent was obtained from them and they were assured of the confidentiality of their information. Patients were admitted to the emergency department and underwent full monitoring including noninvasive blood pressure, electrocardiogram, and pulse oximetry after they

completed the anxiety and admission questionnaires in the operating room. Afterward, patients received 500 cc of Ringer's lactate solution as the preload. The selective spinal anesthesia for patients was performed in the sitting position with 2cc of Bupivacaine 0.5% and 2.5 µg of Sufentanyl using spinal needle 25 (orange) through the lumbar intervertebral space 5-4 [NPSoft1]. Patients immediately sat after the spinal anesthesia, and the surgery began after ensuring about the high level of anesthesia (anesthesia level T4). The type of operation and its procedure as well as the type of drug used for anesthesia were the same for all the patients. The patient would be excluded from the study if the surgical procedure changed for any reason, such as excessive bleeding and/or the need for a hysterectomy, or in case the patient showed severe symptoms of anxiety before surgery.

Data collection was carried out using a demographic characteristics form for gathering such information as age, education level, gestational age, and cesarean section count, as well as the presence or absence of nausea and vomiting. The preoperative anxiety was also assessed using Spielberger's state-trait anxiety inventory.

Spielberger state-trait anxiety inventory (STATE)

This 40 items tool consists of questions (n=20) related to state anxiety (expressing emotions when completing the questionnaire) and questions (n=20) concerning trait anxiety (expressing perpetual negative emotions). Scoring was based on a 4-point Likert scale. The total score of both state and trait anxiety scales ranged from 20 to 80. The validity and reliability of the Persian translation of this questionnaire were approved [19]. In the present study, the reliability of this tool was confirmed through Cronbach's alpha which was measured at 0.86 and 0.73 for the state anxiety and trait anxiety, respectively.

Visual Analogue Scale (VAS)

Intraoperative anxiety was evaluated and recorded using the VAS after postpartum and the severity of the anxiety was indicated by a number from zero (no anxiety) to 10 (maximum anxiety). The VAS is a standard tool that has been utilized in various studies to measure anxiety [20-21].

The presence or absence of nausea and vomiting were evaluated and recorded in patients during the operation (from the time of anesthesia to the end of surgery) and stay in the recovery room. Metoclopramide was used for patients with nausea and vomiting as prescribed by an anesthetist. The obtained results were analyzed using SPSS (version18) through Chi-square test, and

independent t-test. A p-value less than 0.05 ($P < 0.05$) was considered statistically significant.

Results

The study was conducted on 100 patients in the age range of 18-43 years as candidates for the cesarean section. Table 1 presents some demographic characteristics of the patients.

Table 2 presents the relationships between the state anxiety and nausea and vomiting in patients at the preoperative stage. The results indicated that there was no significant relationship between the state of anxiety and nausea with vomiting in patients.

Table 3 presents the relationship between the trait anxiety and nausea with vomiting in patients at the preoperative stage. The results indicated that there was a significant relationship between the trait

anxiety and nausea in patients; however, no significant relationship was observed between the trait anxiety and vomiting.

The independent t-test was used to determine the relationship between intraoperative anxiety and nausea and vomiting in patients (Table 4). The results indicated that there was no significant difference between patients with nausea or vomiting and those who did not have nausea or vomiting, in terms of the anxiety level.

Table 1. Examination of patients in terms of age, gestational age, cesarean section, and delivery

	Min	Max	Mean±SD
Age	18	43	29.35±6.32
Age of pregnancy	29	41	37.82±1.53
Number of Cesarean	1	5	2.07±0.92
Number of deliveries	0	5	0.92±1.23

Table 2. Correlation between the state anxiety before the operation and nausea and vomiting

		Level of state anxiety			Result
		Mild N (%)	Moderate N (%)	Sever N (%)	
Nausea	Yes	23 (79.3)	45 (70.3)	6 (85.7)	$\chi^2 = 1.377$ $p = 0.536$
	No	6 (20.7)	19 (29.7)	1 (14.3)	
Vomiting	Yes	26 (89.7)	60 (93.8)	6 (85.7)	$\chi^2 = 1.552$ $p = 0.473$
	No	3 (10.3)	4 (6.2)	1 (14.3)	

Table 3. Correlation between the trait anxiety before operation and nausea and vomiting

		Level of trait anxiety			Result
		Mild N (%)	Moderate N (%)	Sever N (%)	
Nausea	Yes	27 (87.1)	46 (69.7)	1 (33.3)	$\chi^2 = 5.914$ $p = 0.043$
	No	4 (12.9)	20 (30.3)	2 (66.7)	
Vomiting	Yes	29 (93.5)	61 (92.4)	2 (66.7)	$\chi^2 = 2.832$ $p = 0.305$
	No	2 (6.5)	5 (7.6)	1 (33.3)	

Table 4. The results of independent t-test

			Levin Test		t-Test		
			F	Sig	t	df	Sig
Nausea	Yes	5.48 (1.99)	0.65	0.42	0.19	98	0.84
	No	5.38 (2.26)					
Vomiting	Yes	5.46 (2.06)	0.001	0.99	0.04	98	0.96
	No	5.42 (1.90)					

Discussion

Cesarean section is a common procedure in women's surgery, and spinal anesthesia is the preferred method of anesthesia in this operation. Moreover, postoperative nausea and vomiting are common side effects of this type of anesthesia [14,22]. Therefore, the present study aimed to investigate the effect of anxiety before and during the cesarean section on nausea and vomiting caused by spinal anesthesia. The relationship between state-trait anxiety (preoperative) and intra-operative anxiety with nausea and vomiting was studied in patients. Results indicated that there was a significant relationship only between the trait

anxiety and nausea.

In the present study, most patients reported moderate anxiety in terms of state-trait anxiety and intra-operative anxiety. A study conducted by Ghanei Gheshlagh et al. [18] on 110 patients undergoing general anesthetic surgery showed that there was a significant relationship between preoperative anxiety and postoperative nausea and vomiting. However, differences in results of their study and those of the present study can be justified by the fact that patients in the present study underwent the cesarean section with spinal anesthesia technique and that both the types of surgery and anesthesia can affect the severity of

nausea and vomiting.

The results of another study conducted on 101 female patients undergoing laparoscopic surgery indicated that a high level of preoperative anxiety increased the risk of postoperative nausea and vomit [23].

Based on the results of a study performed on 200 patients undergoing general anesthesia, the factors associated with postoperative nausea and vomiting included no history of cigarette smoking, a history of motion sickness, and high levels of preoperative anxiety [24]. According to the results of the two aforementioned studies and given that most of the patients in the present study reported moderate levels of anxiety, it seems that a low level of anxiety in patients is indicative of the insignificance of all studied parameters.

Another study conducted on 80 women in the age range of 40-50 years under general anesthesia examined the effect of anxiety on nausea and vomiting during the recovery and 24 hours after the operation. Results of their research indicated that preoperative anxiety played an important role in postoperative nausea and vomiting [25]. They examined different types of surgery and anesthesia as well as nausea and vomiting in recovery and 24 hours after operation in their study, while the present study only studied the intraoperative time.

Inconsistent with the results of the present study, another study examined the effect of anxiety on 51 children in the age range of 5-16 years under general anesthesia and found that there was no significant relationship between preoperative anxiety and postoperative nausea and vomiting [26]. However, it should be noted that the mentioned study was conducted on children under general anesthesia; therefore, it differed from the present study in terms of the study population and the employed anesthetic technique.

The results of another study on 1389 patients undergoing general anesthesia with different surgical procedures indicated a significant weak relationship between preoperative anxiety and postoperative nausea and vomiting. This result was significant due to high levels of anxiety found in patients. The authors concluded that factors such as gender, smoking status, history of postoperative nausea and vomiting, and motion sickness were more reliable factors than preoperative anxiety for the prediction of postoperative nausea and vomiting that could be highly predicted by the inclusion of factors, such as age, anesthesia technique, and type of surgery [27].

Based on the obtained results from most studies, high levels of anxiety lead to the development of a significant relationship between preoperative

anxiety and postoperative nausea and vomiting. Therefore, the statistical insignificance of most parameters in the present study can be attributed to the moderate levels of anxiety in most of the participants. According to the reviewed studies, an agent alone cannot be a reliable predictor for postoperative nausea and vomiting and that other factors, such as the history of motion sickness, smoking status, previous history of nausea and vomiting, and the employed anesthesia technique can exacerbate the effect of anxiety on postoperative nausea and vomiting. However, all of these factors were controlled and eliminated as far as possible in the present study.

It should be noted that, to the best of the authors' knowledge, no similar study had compared preoperative and intraoperative anxiety to investigate intraoperative anxiety.

Given the differences in results of the reviewed studies, it is suggested that future studies should be carried out with larger sample size, take into account other factors affecting postoperative nausea and vomiting, examine nausea and vomiting with more time intervals from the surgery, and use other scales for the investigation of anxiety in patients. Since the present study was conducted on a limited number of patients and with a specific type of surgery, the results could not be generalized to all patients. It should be noted that conducting research in different centers with different surgeries will improve the confidence of data and reduce the intervening factors.

Conclusions

Based on the results of the present study, postoperative nausea could be affected by preoperative and intraoperative anxiety in patients and a high percentage of patients experienced moderate levels of anxiety. Therefore, appropriate measures should be taken by the healthcare staff during hospital admission to reduce the anxiety in patients.

Compliance with ethical guidelines

This study has been approved by the Research Ethics Committee in Hamadan university of medical sciences (IR.UMSHA.REC.1394.308).

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Conflict of interest

The authors declare that there is no conflict of interest regarding the publication of this study.

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