



RESEARCH ARTICLE

The Prevalence of Complications after Spinal Anesthesia in the Recovery Unit: A Cross-sectional Descriptive Study on Hospitals of Jahrom, Fars Province, Iran

Reza Inaloo¹, Saeid Nikooei², Navid Kalani²,
Vahid Zarean², Masoud Ghanei^{2*}

¹Department of Urology, Jahrom University of medical sciences, Jahrom, Iran.

²Department of Anesthesiology, Jahrom University of Medical Sciences, Jahrom, Iran.

Study Area: Jahrom, Iran

Coordinates: 28°30'00"N; 53°33'38"E

Key words: Back pain, Shivering, Needle gauge, Bradycardia

Approvals of the Ethical Committee at Jahrom University of Medical Sciences (IR.JUMS.REC.1394.201) and of the officials at the Peymanieh and Motahari hospitals were obtained.

Introduction:

Anesthesia recovery (awakening) is one of the three stages of anesthesia that begins after discontinuation of anesthetic drugs. This stage usually involves transferring the patient to the recovery unit or the postoperative care unit and caring for them until they are taken to their bed. Recovery is one of the most crucial stages of anesthesia and there are many reports of high prevalence of respiratory and cardiovascular complications, nausea and vomiting, chills, restlessness, and shivering. Recent studies have indicated the high prevalence of postoperative complications. In addition, the high class of patients based on ASA, longer duration of anesthesia, emergency surgeries, history of some underlying diseases, and smoking have been suggested as risk factors in this regard (Stoelting & Dierdorf, 1994). Some metabolic including the body responses to surgery can cause the imbalance of major physiological functions. Moreover, the delayed effects of anesthetic drugs undermine the natural ability of the body to stabilize physiological balance and maintain health, which finally causes post-anesthetic complications. The objective of the post-anesthesia care unit (PACU) team is to gradually awaken the patient, reduce sudden physiological changes, quickly recognize and correct the airways obstruction, control blood pressure, reduce complications such as pain, and control

Abstract

Surgeries and anesthesia applications sometimes cause physiological disorders, which can affect the patient and create some symptoms in the recovery unit. Therefore, its become essential to know more about these complications. The present research was a cross-sectional descriptive study, conducted on 150 patients aged 18-70, undergone spinal anesthesia and then were referred to the recovery unit. The general information of patients and data on complications after the spinal anesthesia were collected and then statistically analyzed. The results showed that the most prevalent complications in the recovery unit include shivering hypotension, nausea, bradycardia, back pain, delirium, vomiting, and hypotension. The high prevalence of complications in the post-anesthetic care unit can be considered an alarm and also highlights the importance of benefiting from skilled personnel and monitoring equipment in this unit.

body temperature, restlessness, delirium, nausea, and vomiting (Miller, 2010). Due to the complexity of care in the recovery unit and its connection with many other sections and since patients are more exposed to risks and damages in the recovery unit, patients remains continuously under the care of a surgeon, an anesthesiologist, and a recovery nurse (Joris *et al.*, 1993). According to Frouliti, (1987) post-anesthetic care has a nursing nature and the recovery unit is a critical care unit. Earlier reports suggest a large number of patients in the recovery unit experience postoperative complications (Hines *et al.*, 1992; Kluger & Bullock, 2002; Magni *et al.*, 2007; Tarrac, 2006). As per Tarrac (2006) a quarter of patients in the recovery unit experience complications and required medical interventions. In a study conducted in New Zealand, it was seen that 29% of postoperative complications led to a major physiological disorder and needed long-term nursing care in the recovery unit or in the intensive care unit (Kluger & Bullock, 2002). Poursheikhian (2012) reported that considerable changes in blood pressure (42%), heart rate (36%), pain (26%), nausea and vomiting (12%) and respiration (49%) were observed in such types of recovering the patients. The prevalence of shivering was reported to be 5-65%, which is a more common disorder after long surgeries in men (Buggy, 2000). Delayed recovery and recovery with

*Corresponding Author: MasoudGhanei@yahoo.com

complications caused by anesthesia negatively affect the health of patients and their satisfaction. It also increases the medical costs, and reduce the efficiency of recovery resources (Dexter *et al.*, 1999; Leslie *et al.*, 2005). Considering the above figures and facts, the present study aims to find out the prevalence of spinal anesthesia complications in the recovery unit of hospitals of Jahrom, Fars Province.

Methodology:

The present research was a cross-sectional descriptive study conducted on 150 patients aged 18-70 undergone a surgery influencing spinal anesthesia in teaching hospitals affiliated with Jahrom University of Medical Sciences in 2016-2017. The inclusion criteria were being aged 17-80 and class 1 and 2 of ASA whereas, the only exclusion criterion was affliction with respiratory, cardiovascular, and digestive diseases. After obtaining the necessary permission from the Research and Technology Deputy and the Ethics Committee of Jahrom University of Medical Sciences, the authors visited the research location to brief the operating room team about the research objective and procedure and did sampling. The participants were categorized into 2 classes; class 1 (healthy patients) and class 2 (patients with mild systemic problems) of ASA. All the patients underwent spinal anesthesia with 0.05 Marcaine using the 25 gauge needle. The required data were collected using a set of questionnaire, consisted of two parts; i) basic information (age, gender, file number, type and duration of surgery, and primary vital signs), ii) complications after spinal anesthesia (hypotension, bradycardia, headache, long spinal anesthesia, arterial hypoxemia, hypercalciuria, delirium, nausea, urinary retention, and back pain). The data were analyzed using descriptive statistics (percentage, mean, and standard deviation) in SPSS-21.

Results:

The demographic information of the participants is presented in the Table-1. The mean age and weight of patients participated in this study was equal to 41.96±17.02 and 69.88±88, respectively.

As per the Table-2, shivering was the most common complication to recover for the patients undergone a surgery with spinal anesthesia. Hypotension and nausea had the highest prevalence after shivering. This could be used as an applied key in the recovery unit of teaching hospitals in Jahrom. The most common complication of spinal anesthesia in the recovery was shivering (1.60±0.95), with more frequency in women (1.68±1.00) than men (1.57±0.92). As per the results of ANOVA, there is no significant relationship between gender and shivering (p>0.519). However, the higher mean prevalence of shivering in women could be attributed to their weaker musculoskeletal system as compared to men (Table-3).

Table-1: Basic data of the patients participants of the study

Variable	Category	Number	Percentage
Gender	Male	103	68.7
	Female	47	31.3
Anesthesia class	Class 1	128	85.3
	Class 2	22	14.7
Length of the hospitalization	<60 minutes	113	75.3
	60-120 minutes	31	20.7
	>120 minutes	6	4
Type of surgery	Orthopedic	40	26.7
	Urology	59	39.3
	General	27	18
	Obstetrics and Gynecology	24	16

Table-2: Prevalence of complications after spinal anesthesia in the recovery unit

Variable	Category	Number	Percentage
Hypotension	No	114	76
	Yes	36	24
Bradycardia	No	121	80.7
	Yes	29	19.3
Delirium	No	133	88.7
	Yes	17	11.3
Nausea	No	114	76
	Yes	36	24
Vomiting	No	137	91.3
	Yes	13	8.7
Urinary retention	No	138	92
	Yes	12	8
Back pain	No	131	87.3
	Yes	19	12.7
Hypoventilation	No	141	94
	Yes	9	6
Shivering	No	95	63.3
	Mild	32	21.3
	Moderate	10	6.7
	Severe	13	8.7

Table-2: Comparative shivering between male and female

Sex	Number	Mean	Standard Deviation	p-value
Male	103	1.5728	.92463	0.519
Female	47	1.6809	1.00231	
Total	150	1.6067	.94760	

Discussion:

The present research was one of the first studies conducted in Iran on the subject towards the recovery related complications. In our study, the complications after spinal anesthesia and the effects of some of the factors such as age, gender, and type and length of the surgery on the occurrence of such complications were studied. Shivering is an involuntary vibration of the body due to an underlying condition such as cold and hypothermia (Dorland, 2011). In the present study, the

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prevalence of shivering, mostly the mild level, was equal to 36.7% and is similar to Entezari *et al.* (2001) and also reported to vary between 5-65% in some other studies. Further, Buggy (2000) reported that the shivering was more common among men and our findings also strengthened the same. Shivering increases the consumption of oxygen, which is necessary for the treatment of patients, especially those having the cardiovascular problems. The size of the needle used for anesthesia is also one of the factors causing postoperative shivering. Ghanei & Mehraban (2015) reported that the prevalence of shivering after anesthesia using a 26 gauge needle was equal to 36%. One of the common complications towards recovery mentioned in various references is cardiovascular problems, which are manifested as sudden changes in blood pressure and heart rate. In the present study, 24% of patients experienced hypotension. This can be overcome by replacing proper fluids during the surgery. In the study of Ghanei *et al.* (2016) the infusion of 5% hydroxyl starch during the surgery shown to prevent postoperative hypotension. The type of medication used in spinal anesthesia could also be effective in preventing postoperative hypotension. Vaghadia *et al.* (1997) stated that low doses of lidocaine hyperbaric and fentanyl in spinal anesthesia give better effects on the reduction of postoperative hypotension. In the present study, bradycardia was observed in 19.3% of participants. Poursheikhian (2012) reported that the prevalence of bradycardia was equal to 18% and its prevalence had a significant relationship with age and heart rate. The prevalence of nausea and vomiting in the present study was equal to 24% and 8.7%, respectively. These figures in the study of Nasiri *et al.* (2006) were reported to be 10% and 2.5%. In addition, this group of authors also reported the prevalence of postoperative nausea and vomiting as 12%. The study conducted by Nematshahi *et al.* (2011) suggested the usefulness, cost-effectiveness, and fewer complications of ondansetron in the prevention of nausea and shivering compared to meperidine (an opioid). In the present study, 11.3% of the participants experienced delirium. This figure was reported to be 30.6% by Juybari *et al.* (2012). It seems that timely diagnosed of delirium in the PACU could be a good guide for nurses in the postoperative care units to perform appropriate interventions to prevent negative complications. Regarding back pain after spinal anesthesia, earlier studies reported that the prevalence of this complication ranges between 2.5% and 54% (Gregg *et al.*, 1992; Schultz *et al.*, 1996). In the present study, 12.7% of patients had complained regarding back pain. This is somewhat consistent with the findings of Haghghi *et al.* (2012) who reported that 16% of patients experience back pain one day after anesthesia. Some factors such as the size and form of needle, patient's age, and the number of

surgical items are involved in the occurrence of postoperative back pain. In a study conducted by Ghanei & Mehraban (2015) the prevalence of postoperative back pain using the needle sizes of 26 and 25 were 35.4% and 26.9%, respectively. Urinary retention, which is a possible postoperative complication with local anesthesia, is associated with different factors such as the type of surgery, anesthesia method, and type of analgesics. In the present study, the prevalence of urinary retention was equal to 8%. Najafi *et al.* (2012) compared the effects of lidocaine and pethidine in spinal anesthesia on the occurrence of urinary retention after anorectal surgery but no significant difference between lidocaine (33.3%) and pethidine (23.3%) in terms of causing urinary retention was evidenced. The study results also showed that 6% of participants experienced hypoventilation. Triyasunant *et al.* (2015) stated that hypoxemia was less prevalent in elective cesarean sections and, as a result, oxygen therapy was also less common in this unit for the treatment of this complication.

Conclusion:

The high prevalence of complications in the post-anesthetic care unit can be considered as an alarming state and also highlights the importance of benefiting from skilled personnel and monitoring equipment in this unit. This can increase the health level of patients and prevent the waste of time and cost.

Acknowledgment:

We would like to express our gratitude to the Clinical Research Development Unit at the Peymanieh Educational, Research, and Treatment Center of Jahrom University of Medical Sciences for providing the facilities required to carry out this research.

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