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Reporting a Case: Cardio-respiratory Arrest after Spinal Anesthesia

Majid Vatankhah[1], Seyed Hamed Hojati[2], Navid Kalani[3], Mohammad Hasan Damshens[4*]

[1]Anesthesiology, Critical Care and Pain Management Research Center, Hormozgan University of Medical Sciences, Bandar Abbas, Iran

[2]Student Research Committee, Jahrom University of Medical Sciences, Jahrom, Iran

[3]Research Center for Social Determinants of Health, Jahrom University of Medical Sciences, Jahrom, Iran

[4]Anesthesiology, Critical Care and Pain Management Research Center, Jahrom University of Medical Sciences, Jahrom, Iran

ABSTRACT

Introduction: Hypotension, bradycardia and even cardiac arrest are considered as risk factors for spinal anesthesia. Cardiac arrest due to neuraxial anesthesia requires rapid intervention to prevent neurological damages and death.
Introducing the patient: A 91year-old patient referred to the operating room of Jahrom Peymanieh Hospital, because of previous operation of femoral neck fracture and bed ridden with bed sore in the sacrum area. The patient did not show any significant problems during the spinal anesthesia during the operation, but at the end of the operation and after changing his lateral position to supine position suffered a cardio-respiratory arrest, which immediately we began the CPR and after recovery of the patient, he transferred to the ICU.
Conclusion: When patients position changed from lateral to supine, a possibility of cardiopulmonary arrest, especially in the elderly.

Key words: Spinal anesthesia, Bradycardia, Hypotension, Cardiac arrest

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Corresponding author: Mohammad Hasan Damshens
e-mail ✉ **:**damshenas_mh@gmail.com
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INTRODUCTION

Spinal anesthesia, although being considered a safe method, is not without complications, which can vary from a simple headache to a serious heart attack. Cardiac arrest after spinal anesthesia has been reported since the early 1990s. The precise mechanism of cardiac arrest is not completely determined, but it seems to be due to imbalance in autonomic nervous system along with limitations in sympathetic nerves and increased activity of parasympathetic nerves [1]. Most researchers believe that cardiac arrest in general anesthesia is more prevalent than in spinal anesthesia [2,3]. In fact, cardiac arrest during anesthesia and before surgery is a serious concern for any anesthetist. Occasionally, unexpected bradycardia and Asystole may also occur during spinal anesthesia in apparently healthy and young patients. Frequency of cardiac arrest during neuraxial anesthetics has been reported 1.3 to 18 out of 10,000 cases [1]. This study reports a cardio-respiratory arrest for a 91 year-old patient following a spinal anesthesia.

PATIENT'S INTRODUCTION

Patient was a 91-year-old man with weight of 87 kg that two weeks ago because of a femoral fracture of his right leg had undergone an orthopedic surgery with spinal anesthetic. Due to being bed ridden for two weeks with an infected bed sore in Sacrum area, he referred to operating room of Peymanieh Hospital in Jahrom for debridement and wound healing. In anesthesia consultation prior to AF operation, hypertension and EF: 55% were reported. When entering the operating room, the patient was monitored for blood pressure, ECG and pulse oximetry and hemodynamic conditions (systolic blood pressure=90, diastolic blood pressure=60 mmHg, and heart rate=64), as well as arterial oxygen saturation 96% and normal AF rhythm was recorded for him. After further examination and taking into account special conditions of the patient such as being old and consequently cardiovascular

diseases as well as his mental status, we decided to use spinal anesthesia for surgery. When disinfecting the patient's waist for spinal anesthesia, the anesthesiologist detected active infection in the area. However, due to the patient's specific conditions and greater safety, spinal anesthesia was preferred to general anesthesia in this patient. Eventually, after 500 ml liquid therapy with Ringer's solution, the patient was examined for spinal anesthesia. After specifying the place of needle insertion in the space between the second and third vertebra (due to less infection in this area), the area was disinfected and dried with betadine. Then, the needle (No. 25, Quincke type) entered sub arachnoid from the mentioned space and after extraction of Cerebro Spinal Fluid, 2.5 cc of marcaine 0.5% was injected. In supine state, anesthesia level was estimated to be T10 and then patient was placed in the lateral position. After changing the patient's position, debridement operation was employed by surgeon on necrosis tissue and sacrum's infection. Bleeding in the surgery area was controlled by the surgeon and wound was washed by 10 litres of normal saline and then dressed. At the end of the operation and when returning to supine position, the patient suddenly suffered severe cardiac arrest and then cardiac-respiratory arrest, which immediately cardiac-respiratory rehabilitation and intubation of the patient was performed by tube number 8 in less than 15 seconds. During 30 minutes CPR on the patient, we used drug therapy with 1.5 mg of atropine, 20 mg of ephedrine, 150 mg of amiodarone per 100 cc of dextrose water 5%, 5 mg of norepinephrine per 50 cc of dextrose water 5%, 0.25 mg of digoxin And dopamine in infusion manner. During the recovery, patient's systole blood pressure varied from 60 to 120 mmHg and his heart rate varied from 125 to 150 mmHg. After improvement of the patient's status, he was transferred to ICU for further care and after 4 days of complete monitoring and drug therapy and improvement of his general status was transferred to the general section and then discharged from the hospital.

DISCUSSION

The use of anesthesia technique depends on various factors such as anesthetist's preferences, patient, age, type of surgery, underlying illness, surgery site, duration of surgery, and pain control methods [4,5]. Studies show that spinal anesthesia can reduce bleeding, reduce early pain, and reduce postoperative nausea and vomiting [6]. Indeed, neuraxial blocks such as spinal can lead to sympathetic block, motion block, numbness and analgesia [7]. Spinal anesthesia (SA) is a safe way to ensure analgesia during various surgical stages. The most common side effects of SA are hypotension and bradycardia. Prevalence of hypotension and considerable bradycardia by using anesthesia techniques is about 15%-38% and approximately 10%, respectively [8-10]. Hypotension is associated with decreased systemic vascular resistance or reduced collected peripheral blood due to reduced intravenous flow to heart or both of them. These two effects are derived from sympathetic block with spinal anesthesia and modular adrenal secretion block. Upper level of sympathetic block is associated with an increased risk of hypotension. With neuraxial block below T4 level, vasoconstriction above the block level may increase or decrease hypotension. In addition, the block of cardiac accelerator fibers (caused by T1 to T4 nerve roots) with high anesthesia level can reduce heart rate and cardiac output. When a similar dermatomal block is obtained with epidural and spinal anesthesia, there will be a similar incidence of hypotension; however, beginning of hypotension will be slower with epidermal anesthesia [11]. Indeed, level of numbness above T4 is known to be a risk factor for severe bariatric disease and even cardiac arrest, which is due to blocking of the same T1 to T4 fibres, which are responsible for increasing heart rate [12]. Contraindication of spinal and epidural anesthesia involves examples such as patient's avoidance of anesthesia, sepsis, infection at the site of anesthesia, increased intracranial pressure, allergy to anesthesia anesthetic drugs, and inability of the patient to maintain the position of the body to perform anesthesia and coagulation problems [13]. According to Chan et al., during the first 14 hours after anesthesia, mortality was reported to be 0.51%, of which 98% were reported in general or combined anesthesia and 2% in anesthesia anesthesia [14]. In a prospective study by Kopp, which was performed over 20 years, it was shown that the mean time for heart failure was 50 minutes (0-120 range) after the last anesthesia anesthetic injection (intrathecal, epidural, caudal) [15]. According to Sprung et al., frequency of cardiac arrest following regional anesthesia was 1.5 cases out of every 10,000 cases, which less than that of general anesthetic, i.e. 5.5 cases out of every 10,000 cases [2]. Ray showed that cardiomyopathy is known before surgery, it may not be effective in choosing anesthesia technique and general or regional anesthesia can be used [16].

CONCLUSION

Due to special condition of the patient, i.e. his age and heart disease as well as an active infection near the anesthesia site, postponing the surgery and monitoring the patient to improve the patient's condition seems to be the most appropriate solution. However, due to the urgent need of the patient to treatment and the lack of delay in it, and because of the extent and progression of infection of the wound, spinal anesthesia was a better choice compared to general anesthesia.

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CONFLICT OF INTEREST

The authors declared no potential conflicts of interests with respect to the authorship and/or publication of this paper.

REFERENCES

1. Limongi JA, Lins RS. Cardiopulmonary arrest in spinal anesthesia. Rev Bras Anestesiol 2011; 61:115-20.
2. Sprung J, Warner ME, Contreras MG, et al. Predictors of survival following cardiac arrest in patients undergoing noncardiac surgery-A study of 518,294 patients at a tertiary referral center. Anesthesiology 2003; 99:259-69.
3. Zuercher M, Ummenhofer W. Cardiac arrest during anesthesia. Curr Opin Crit Care 2008; 14:269-74.
4. Nordin P, Haapaniemi S, van Der Linden W, et al. Choice of anesthesia and risk of reoperation for recurrence in groin hernia repair. Ann Surg 2004; 240:187.
5. Habibi MR, Baradari AG, Soleimani A, et al. Hemodynamic responses to etomidate versus ketamine-thiopental sodium combination for anesthetic induction in coronary artery bypass graft surgery patients with low ejection fraction: A double-blind, randomized, clinical trial. J Clin Diagn Res 2014; 8:GC01.
6. Yilmaz C, Buyrukcu SO, Cansever T, et al. Lumbar microdiscectomy with spinal anesthesia: Comparison of prone and knee-chest positions in means of hemodynamic and respiratory function. Spine 2010; 35:1176-84.
7. Brown DL. Spinal, epidural, and caudal anesthesia. Miller's Anesthesia 2010; 1611-38.
8. Covino BG, Scott DB, Lambert DH. Handbook of spinal anaesthesia and analgesia. Mediglobe 1994.
9. Favarel-Garrigues JF, Sztark F, Petitjean ME, et al. Hemodynamic effects of spinal anesthesia in the elderly: Single dose versus titration through a catheter. Anesth Analg 1996; 82:312-6.
10. Hartmann B, Junger A, Klasen J, et al. The incidence and risk factors for hypotension after spinal anesthesia induction: An analysis with automated data collection. Anesth Analg 2002; 94:1521-9.
11. Bonica JJ, Kennedy Jr WF, Ward RJ, et al. A comparison of the effects of high subarachnoid and epidural anesthesia. Acta Anaesthesiol Scand 1966; 10:429-37.
12. Somboonviboon W, Kyokong O, Charuluxananan S, et al. Incidence and risk factors of hypotension and bradycardia after spinal anesthesia for cesarean section. J Med Assoc Thai 2008; 91:181.
13. Neal JM, Barrington MJ, Brull R, et al. The second ASRA practice advisory on neurologic complications associated with regional anesthesia and pain medicine: Executive summary 2015. Reg Anesth Pain Med 2015; 40:401-30.
14. Chan RP, Auler Jr JO. Retrospective study of the incidence of anesthetic-surgical deaths in the first 24 hours. Revision of 82,641 anesthetics. Rev Bras Anestesiol 2002; 52:719-27.
15. Kopp SL, Horlocker TT, Warner ME, et al. Cardiac arrest during neuraxial anesthesia: Frequency and predisposing factors associated with survival. Anesth Analg 2005; 100:855-65.
16. Ray P, Murphy GJ, Shutt LE. Recognition and management of maternal cardiac disease in pregnancy. Br J Anaesth 2004; 93:428-39.