SUCCESSFUL SPINAL ANESTHESIA IN THE PATIENT WITH LOW EJECTION FRACTION (EF)

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ABSTRACT

Spinal anesthesia has advantages when compared with general anesthesia although it has also some disadvantages such as bradycardia and hypotension. The most patients performed hip and lower extremity surgery are in elderly age group. The presence of cardiac, endocrine, renal, cerebral and respiratory disorders in this age group increases the risk for preoperative and postoperative morbidity and mortality rates. This case report has presented the anesthetic management in the 88-year-old female patient with an EF of 30% operated for right hip fracture.

Key words: Spinal anesthesia, elderly patient, low EF, hypotension, bradycardia

INTRODUCTION

The subjects aged 65 and over are accepted elderly population while ones aged 80 and over are accepted very elderly population 1. The blockade of sympathetic fibers occurring due to cephalic spread of local anesthetic injected into subarachnoid space during spinal anesthesia may lead to cardiovascular side effects 2. In the partial sympathectomies at the 8th thoracic level; sympathetic fibers from cranial level of block provides vasoconstriction and physiological compensation 3-4. During blockades arising to 14 thoracic level; exposure in cardiac accelerator fibers may lead to reduced heart rate 3. It has been found in the studies that high sensory blocks are more predisposing factors for hypotension in the supine position when compared with lateral decubitus position in the elderly patients with low ejection fraction 5. It has been also suggested that sensory block level and presence of a chronic disease are effective in development of hypotension whereas elder age is not 6.

CASE REPORT

The 88-year old female patient whose operation was planned for right hip fracture was admitted to intensive care unit from Orthopaedic service due to respiratory distress in September, 2013 Anaesthesiology and Reanimation Clinic of Van Regional Training and
Spinal anesthesia in patient with low ejection fraction

Research Hospital. She was conscious, cooperative, showing tachypnea and having pulse oximetry saturation level of 88%. Her baseline blood gas tests resulted: pH: 7.31, \( p\text{CO}_2 \): 5, \( p\text{O}_2 \): 22, HCO\(_3\): 24.9, BE: -1.6. Following 1 day follow-up period without any complication, preoperative cardiology consultation demonstrated normal sinus rhythm despite an EF of 30% and the ASA 4 patient was taken to operation with high risk and performed a successful spinal anesthesia using bupivacaine hydrochloride 12.5 mg. Surgery was initiated by sensory block reaching to T8 dermatome level. The patient was administered 2 mg demizolam by 20-minute intervals for sedation. After block level reached thoracic 12 dermatome level; the patient was administered 5mg+5mg ephedrine and head of the bed was elevated by 45°. The fluid management was regulated as 1000cc isotonic + 500cc HES solution. The clinical course revealed 95-96% of oxygen saturation and TA 70/40 using \( O_2 \) mask at a rate of 4 l/min. No hemodynamic or respiratory complication occurred in the 75-minute operation. The patient was transferred to PACU (Post Anesthesia Care Unit) without any complication. After sensory block regressed to T10 level; she was sent to intensive care unit to be monitored. After offset of motor block in the postoperative 3rd hour, the first analgesic requirement of the patient occurred in the postoperative 4th hour was relieved by 50mg iv tramadol.

DISCUSSION

The presence of a chronic disease and use of different medications may be predisposing to development of hypotension in the elderly patients.\(^6\) It has been detected that sensory block levels over T6 in the 88-year old ASA 4 patient operated under spinal anesthesia was an effective factor for development of hypotension due to spinal anesthesia. Our results were found compatible with Oğurlu et al (2006).\(^6\)

Spinal anesthesia was preferred because of elderly age and limited lung capacity in the present case. Isotonic 1000cc was used considering that excessive fluid load may lead to pulmonary edema beside 6% HES 500cc solution for occurring hypotension. Spinal anesthesia was performed successfully using bupivacaine hydrochloride 12.5 mg. Parallel with our study, Valanne et al (2001) have conducted a successful spinal intervention using hyperbaric bupivacaine 4 mg in the patients who underwent knee arthroscopy.\(^7\) Similarly, Celik et al (2010) have shown that efficient anesthesia may be provided by spinal anesthesia using hyperbaric bupivacaine 5 mg during hip surgery without affecting hemodynamic conditions.\(^8\) Differently from this case, Biboulet et al (1993) have needed to administer an additional dose of local anesthetic due to inefficient anesthesia induced using bupivacaine 5 mg by placing intrathecal catheter.\(^9\) The difference between efficient dosages used for the cases may due to varying application site. When the analgesic level induced by same dosage of constant local anesthetic was compared between young adults and elderly subjects; analgesic level was found 3-4 segments higher in the elderly subjects. Elderly age and high dermatome level have been suggested as the essential factor for hypotension observed during spinal anesthesia.\(^10\)

CONCLUSION

Spinal anesthesia is a preferred option due to limited lung capacity and presence of a chronic disease in the elderly patients with low EF whereas high sensory block and using
medications for chronic disease may lead to development of hypotension. It has been presented in our case that efficient anesthesia may be induced using bupivacaine hydrochloride 12.5 mg in hip surgery.

CONSENT

Written informed consent was obtained from the patient for publication of this case report.

COMPETING INTERESTS

The authors declare that they have no competing interests.

REFERENCES