Annals of Medical Research
DOI: 10.5455/annalsmedres.2019-05-279 2019;26(8):1708-10

Case Report

Application of epidural anesthesia for cesarean section in a patient with multiple sclerosis: Case report and literature review

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Abstract

Multiple sclerosis is a chronic neurological disease that has autoimmune pathogenesis, characterized by chronic inflammation, demyelination and sclerosis in various regions of the central nervous system and progresses with periods of remissions and attacks. A 27-year old patient, who had been followed up for 6 years with a diagnosis of multiple sclerosis, was 38 weeks pregnant and elective cesarean section delivery was planned because of head-pelvis incompatibility. Epidural anesthesia was planned for cesarean section operation and the patient was administered epidural bupivacaine for epidural anesthesia and postoperative analgesia.
No neurological complications were observed during the operation and for 4 months. This case is presented to demonstrate the anesthesia method of epidural anesthesia-analgesia applied to a patient with multiple sclerosis in a safe caesarean section operation.

Keywords: Multiple sclerosis; cesarean section; epidural anesthesia.

INTRODUCTION

Multiple sclerosis (MS) is a chronic autoimmune disease that affects the central nervous system and is characterized by inflammation and demyelination. Although the mechanism is not fully known, genetic, environmental, immunological and microbiological factors are thought to play a role in the etiology (1). Systemic infections, the 3-month period postpartum, preoperative surgical stress and anesthesia may often cause an increase in MS symptoms. Therefore, the greatest concern for anesthetists during surgery and postoperatively is the pre-operative neurological and neuromuscular dis-orders exacerbation (2).

The existing guidelines do not provide sufficient support to clinicians on the point of decision-making related to central neuraxial analgesia-anesthesia in MS patients. The American Society of Regional Anesthesia and Pain Medicine (ASRA) has stated, "the safety of neuraxial anesthesia in patients with central or peripheral nerve system disease has not been confirmed or rejected" (3).

No consensus has been reached in respect of which anesthesia method (neuraxial or general anesthesia) is the safest for cesarean section operations in patients with MS (1).

As there are insufficient high-level prospective studies in literature related to neuraxial anesthesia and outcomes in MS, this case report can be considered to contribute to literature.

CASE REPORT

A 27-year old nullipar female (68 kg, 153 cm) presented at 38 weeks pregnant at the Obstetrics Polyclinic. A cesarean section (CS) delivery was planned due to head-pelvis incompatibility, and the patient was referred to the Anesthesia Polyclinic for preoperative evaluation. It was learned that the patient had received a diagnosis of MS 6 years before because of an attack of optic neuritis. At 4 months after that attack, the patient presented again at hospital with symptoms of excessive fatigue, and

Received: 22.05.2019 **Accepted:** 10.07.2019 **Available online:** 28.08.2019
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these symptoms were evaluated as a second attack. Two years later, the patient experienced a third attack with ataxia, and treatment of glatiramer acetate (1x20mg) was started. For 8 months, the patient continued to take the treatment regularly, but stopped taking this drug when she became pregnant and had experienced no attacks during the pregnancy.

In the preoperative evaluation, sensory loss was determined in the right lower extremity. There were no motor deficits, but the patient reported occasionally seeing floating specks. Deep tendon reflexes were recorded as normal. The airway evaluation resulted in Mallampati II. In the preoperative evaluation, the body temperature was 36.2˚C, pulse was 96 bpm, and blood pressure was 110/58 mmHg. No abnormal pathology was found on electrocardiography (ECG), hemogram and biochemical parameters.

The patient had no contra-indications for CS and was evaluated as ASA II. It was decided to administer epidural anesthesia to the patient. Informed consent was obtained from the patient.

In the operating room, monitorization was made for heart rate, pulse oximetry, ECG and blood pressure. Oxygenation was made with 2 l/min O2. Hydration of the patient was provided with 500 ml 0.9% sodium chloride. To the epidural space between the 3rd and 4th lumbar vertebrae was reached in the lateral decubitus position by using loss of resistance technique with 18 gauge Tuohy needle. After placement of the catheter, a test dose of 2 ml 2% lidocaine without epinephrine was applied then anesthesia was started with 10 ml 0.25% bupivacaine and 50 mcg fentanyl.

Evaluation of the block level was made with the pinprick test. The sensory block reached T10 dermatome in the 8th min and the highest level of T6 dermatome in the 18th min. Throughout the surgery, which lasted 50 mins, no bradycardia (heart rate<60 bpm) or hypotension (systolic blood pressure <90 mmHg) was seen in the patient.

The need for intraoperative and postoperative analgesia was evaluated with a Visual Analog Scale (VAS, 0-10). As VAS was 3-4 when closing the peritoneum, 10 ml 0.25% bupivacaine and 50 mcg fentanyl was again administered from the epidural catheter. The surgical procedure was completed without any problem and APGAR score was 8 in the first examination of the newborn.

The patient was followed up for 1 hour in the postoperative recovery unit and was seen to be hemodynamically stable. When the sensory block was at T10 dermatome and the VAS value was 0, the epidural catheter was removed and the patient was transferred to the ward. The patient was evaluated for pain, the VAS score was 4 on the 6th hour postoperatively and paracetamol 1000 mg was used intravenously.

The patient was followed up per month throughout 4 months on the phone whether she had any exacerbation of MS. No neurological complications were observed during this period.

DISCUSSION

MS is a chronic neurological disease characterized by periods of relapse and remission. In the later stages of pregnancy, sustained rises in estrogens and progesterone likely promote Th1 to Th2 shift that result in downstream inhibition of Th1-mediated proinflammatory cytokines. Yet, after the end of pregnancy there is a sharp and persistent decrease in hormonal levels, including follicle stimulating hormone, luteinizing hormone and consequently lower estrogen and progesterone levels. This abrupt state of hormone withdrawal could result in increased synthesis of proinflammatory cytokines, as seen postpartum after completed pregnancies. Therefore just as in all autoimmune diseases, MS may remain in remission during pregnancy, but in the first 3 months postpartum, the incidence has been reported to be 3-fold higher than that of non-pregnant females (4,5).

The disease generally first manifests at an average age of 32 years, and therefore pregnancy in females with MS is of great importance (6). It is difficult for anesthetist to select the appropriate anesthesia method for this patient population. General anesthesia is often selected for this patient group and is considered to be accepted as a safe method (1). In the past, regional anesthesia techniques were contra-indicated for these patients because of local anesthetic agent toxicity, mechanical trauma, and neuronal ischemia effects, and were avoided as these patients could deteriorate neurologically. However, in recent years, data have been presented showing that regional anesthesia can safely be used in this patient group (7). In a study by Pasto et al (8), it was reported that epidural anesthesia could be applied to MS patients for CS operations and there was no correlation with relapses. In a case series reported by Confavreux et al (9), epidural anesthesia was not determined to increase the risk of progressive neurological deficit.

Perioperative and postoperative stress in patients with MS can result in an unpredictable and varying level of symptom severity. Pain in these patients is a postoperative serious stressor. Therefore, providing suitable pain control may be helpful in preventing complications which could develop postoperatively in MS. In 2 cases reported in literature, neurological deficits that had been present before surgery were seen to have improved after epidural anesthesia (1).

Some studies have recommended that epidural anesthesia could be selected rather than spinal anesthesia in MS patients (1,2). For spinal anesthesia, there are only case-based results showing that neurological complications have not increased. Due to the potential neurotoxic effects of local anesthetics applied to demyelinated areas of the spinal cord, this may be high-risk in this patient group. The application of intrathecal local anesthetic at high concentrations and injury to the blood-brain barrier are reasons for the avoidance of this technique. In addition, ischemia seen more often as a result of hypotension in

spinal anesthesia could also cause greater damage (5,10).

As the current patient wished to experience the moment of birth, general anesthesia was not considered. It was decided to administer epidural anesthesia because of the advantages of causing less hemodynamic change, the use of local anesthetic at a low concentration, a slow onset of the block and a lesser requirement for postoperative analgesia. It was explained to the patient that with the anesthesia method to be applied, she would certainly feel no pain throughout the surgery, she would be awake and would be able to see the newborn infant.

As the patient described feeling pain intraoperatively, the epidural drug was repeated to relieve the immediate pain and to provide postoperative analgesia. No neurological complications were observed in the patient during surgery or throughout the 4-month postoperative follow-up period.

The decision for the appropriate anesthesia method in this patient group must be made from an analysis of the risks and benefits for each patient according to the preoperative neurological examination, the patient's own preference, the knowledge and the skill of the anesthetist.

Active inclusion of the patient and their family in the decision-making process and obtaining informed consent only after answering all the questions they may have is extremely important for the success of the procedure. Behaving appropriately to the sociocultural level of the patient and their family increases compliance with this process and is another important factor reducing stress on the patient.

According to currently available data, the application of epidural anesthesia to MS pregnant patients has shown similar clinical results to those of pregnant patients without MS. Moreover, there has not been seen any increased risk of developing neurological complications in the postpartum period after the application of epidural anesthesia to MS pregnant patients. General anesthesia and the use of volatile anesthetics have been reported to be safe for patients with MS pregnant patient (10). Nevertheless epidural anesthesia is preferrable method because it obtains the mother to see the newborn immediately after the CS operation and to control the postoperative pain easily.

CONCLUSION

In conclusion, epidural anesthesia can be considered as a safe anesthesia method for CS operations in pregnant patients who have MS. However, we believe that longer series are required to establish the safety of this technique.

Competing interests: The authors declare that they have no competing interest.
Financial Disclosure: There are no financial supports

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