Anaesthetic management of LSCS for a known multiple sclerosis parturient: A case report

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ABSTRACT
The concept of anaesthesia and pain management took a major twist after the introduction of local anaesthetic agents and regional anaesthesia such as spinal, epidural and peripheral plexus blocks. Regional techniques replaced general anaesthesia to the extent of up to 60% of anaesthesia practice nullifying the side effects related to general anaesthesia. Even though the contraindications for spinal anaesthesia are generally low, perhaps limited to coagulation abnormalities and hypovolemic shock, Multiple Sclerosis is one particular disease in which spinal anaesthesia is known to exacerbate the symptoms, thus making it a contraindication. Multiple Sclerosis is a rare autoimmune disease in our territory that affects the central nervous system producing multiple patchy demyelinations in the brain and spinal cord. We cautiously avoided spinal anaesthesia for a known multiple sclerosis parturient that came for LSCS and managed her with certain precautions under general anaesthesia. We are presenting this case report as we did not find any previous publications in UAE.

Keywords: anaesthetic, demyelination, multiple sclerosis, spinal anaesthesia, relapse.

INTRODUCTION
Multiple Sclerosis is a rare autoimmune disease twice as common in women, mostly seen in the European countries, United States and Canada, but rare in the Asian region. Disease manifestations of multiple sclerosis reflect the sites of demyelination in the central nervous system and spinal cord1. The anaesthetic management of a known Multiple Sclerosis patient for LSCS deserves attention as most of the caesarian section patients receive spinal anaesthesia, but this particular demyelinating disorder is more prone to exacerbation of symptoms and relapse of the disease itself2.

We could not find any previous publications regarding anesthetic management of multiple sclerosis patients for LSCS. The disease itself has some specific anaesthetic implications such as certain anaesthetic techniques exacerbating the relapse of the disease. This case report, therefore, becomes significant.

CASE REPORT
A 37 year old pregnant woman visited the PAC Clinic for preoperative assessment. She was 4th pregnant, the previous three were normal labors [11 years, 7 years, 3 years respectively] and now planned for LSCS because of breech presentation.

She had blurring of vision in 1996 [17 years back] for which she had been investigated and diagnosed as multiple sclerosis and treated successfully with steroids. Again in 2007 she had facial palsy for which she had been treated with beta interferon. In between those two episodes she was apparently normal, was not on any medications and did not have any neurological symptoms.

On examination she was not anemic and did not have cyanosis or pedal edema. Weight: 78 kg; pulse: 78/min; BP: 128/70mm Hg. The cardiorespiratory systems were clinically normal.

Her central nervous system examination revealed no focal deficit and the higher functions were normal. At the time she was not on any medications except the pregnancy supplements.
CBC, urine analysis, and routine lab investigations were normal.

Counseling regarding general anesthesia for her elective LSCS was done as spinal anesthesia was not recommended for her. The anesthetic management, post-operative pain management and the risks involved in her case were explained to her, and consent was obtained.

**ANAESTHETIC MANAGEMENT**

As soon the patient had been shifted to the theater the vital parameters were recorded: pulse 82/min; BP 124/78 mmHg; temperature 37°C.

Monitors included pulse oximeter, ECG, NIBP, EtCO2, Temperature (Nasal), FiO2 and anesthetic agent monitors.

The patient was induced with 200 mg of propofol and intubated with 40 mg of Rocuronium. Anesthesia was maintained with O2, N2O and sevoflurane (2%). Fentanyl was given after the delivery of the baby. Oxytocin was added to Ringer solutions for uterine contractions. Vital parameters viz. pulse BP and temperature were recorded and were within normal limits. 1500 ml of (non-warmed) Ringer lactate solution was infused throughout the procedure and OR temperature was maintained at 24°C.

The patient was extubated immediately after surgery uneventfully.

Post-operative analgesia was covered with IV Paracetamol, Diclofenac suppository, and morphine [PRN]. The patient was discharged after 48 hours and her follow up so far has been uneventful.

**DISCUSSION**

The physiological changes that occur during pregnancy such as increased oxygen demand, deceased respiratory reserve, engorged breast, edematous upper airway, aspiration due to gastric regurgitation, and delayed gastric emptying constitute a nightmare for the anaesthetist to deliver general anesthesia for caesarian delivery. Hormonal changes and placental-fetal circulation further limit the freedom of anaesthetic drug delivery. Central neuraxial blocks such as spinal and epidural spares the airway management, and intense analgesia which extends to the post operative period, minimal drug interactions, and the absence of placental crossing of anaesthetic drugs make the patient as well as the anaesthetist comfortable. Lumbar lordosis and sacral edema during pregnancy are the limitations that challenge the anaesthetist’s skill.

In the management of anesthesia in patients with multiple sclerosis the impact of surgical stress and the natural progression of disease must be considered. The diagnosis of multiple sclerosis can be established with the clinical features, monoclonal abnormalities of immunoglobulins in CSF, prolonged latency of evoked potentials in nerve conduction studies and the demyelinated plaques in MRI.

The course of multiple sclerosis is characterized by exacerbations and remissions of symptoms at unpredictable intervals over a period of several years. Some patients will have remissions without residual deficit but mostly there will be residual deficit which may progress with further relapse.

The treatment of multiple sclerosis includes corticosteroids, beta interferon, glatiramer acetate (It is a mixture of random synthetics polypeptides synthesized to mimic myelin basic protein used for patients who become resistant to beta-interferon therapy). The supportive management includes antidepressants, centrally acting muscle relaxants and anticholinergics. These drugs have interactions with anesthetic agents that need to be taken into consideration.

Demyelination and scarring can occur at various levels and can produce a range of symptoms. Their anesthetic implications are listed in Table 1.

The course of multiple sclerosis in women shows some important findings during pregnancy. The rate of relapse...
during pregnancy decreases particularly in the third trimester and increases during the first three months of the postpartum period.  

Thus, regardless of the anaesthetic technique and the drugs selected for use during the perioperative period it is likely that the symptoms of multiple sclerosis would exacerbate during the postoperative period in this particular case.

Any increase in the body temperature during the perioperative period may be more likely than drugs to be responsible for an exacerbation of symptoms as any, even 0.5 degree, increase in body temperature may lead to a complete block of conduction in myelinated nerves.

Spinal anaesthesia has been implicated in post-operative exacerbation of multiple sclerosis. The mechanism by which spinal anaesthesia exacerbate the disease is unknown but might reflect local anesthetic toxicity. Epidural may be less of a risk because the concentration of LA drugs used is less.

General anaesthesia is most often chosen for anesthetic management in Multiple Sclerosis.

There are no specific drug recommendations but muscle relaxants usage need attention as succinylcholine may lead to hyperkalemia and increased responsiveness to NDMR drugs.

Our key concerns about this patient were avoiding regional techniques like spinal anaesthesia, temperature monitoring and preventing rise in temperature and the judicious use of muscle relaxants.

Our patient induction was smooth with propofol and intubation with Rocuronium.

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Table 1: Anaesthetic implications of multiple sclerosis

<table>
<thead>
<tr>
<th>Demyelination affecting</th>
<th>Clinical signs and symptoms</th>
<th>Anesthetic implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brain</td>
<td>Depression, fatigue, painful seizures, pain syndromes, sensory deficits</td>
<td>Interaction with antidepressants, anticonvulsants agents used for treatment of pain</td>
</tr>
<tr>
<td>Corticospinal tracts</td>
<td>Upper motor neuron type of paralysis with spasticity, hyperactive deep reflexes, upgoing Babinski</td>
<td>Upregulation of acetylcholine receptors, altered response to muscle relaxants: N-M monitoring</td>
</tr>
<tr>
<td>Brain-stem, optic tracts, cranial nerves</td>
<td>Visual-impairment, nystagmus, diplopia, trigeminal neuralgia, dysarthria, dysphagia, depressed pharyngeal, laryngeal reflexes</td>
<td>Interaction with pain medications used for trigeminal neuralgia—Use of Sellick's manoeuvre, H₂ blockers, proton-pump inhibitors, anti-emetics</td>
</tr>
<tr>
<td>Brain-stem and spinal cord</td>
<td>Autonomic dysfunction with cardiac dysrhythmia, Impaired control of ventilation, reduced response to raised pCO₂, diaphragmatic paralysis, ventilatory problems due to reduced respiratory muscle strength, limb-weakness, paresthesias, sensory deficits, Pain-medications/ Drugs for spasticity</td>
<td>Cardiac dysfunction—Hypotension with Inhalational agents, regional techniques with poor response to fluid loading and pressor agents. Hypoventilation, hypoxemia, apnea, resp. failure post-operative O₂/mechanical ventilation indicated. Cardiovascular, respiratory monitoring essential. Resistance/sensitivity to N-M blockers, N-M monitoring essential</td>
</tr>
<tr>
<td>Others</td>
<td>Even 0.5° rise in body temperature can cause exacerbation</td>
<td>Core and surface temperature monitoring</td>
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</tbody>
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GMJ, 5th Annual Scientific Meeting of Gulf Medical University Oral Proceedings 2013
www.gulfmedicaljournal.com
in three minutes. Intraoperative temperature was maintained by OT temperature maintenance and avoiding warming of IV fluid. Even though the patient did not have any muscle wasting or spasticity, we avoided Succinylcholine and a minimal dose of NDMR was used. Hence no reversal agents were used as the recovery was good with adequate tidal volume and extubated with full awake.

In our case on one month follow up the patient did not have any relapse.

To conclude, the anesthetic management of caesarian section in multiple sclerosis patients needs special attention of selection of anaesthesia technique, judicious use of drugs, perioperative monitoring and follow up to avoid iatrogenic factors of disease exacerbations.

REFERENCES