Anesthetic Management Of Pregnant Patient With Multiple Sclerosis

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Abstract

Multiple sclerosis is a rare neurological disease, which affects young adults. Its course is unpredictable and runs over decades. It is considered as an autoimmune disease in which there is demyelination of the brain and spinal cord. The case presented is a young adult pregnant UAE national who was a known case of multiple sclerosis from 1998, had 4 relapses till 2009 when she got pregnant. During each episode, she was treated with methyl prednisolone. Since 2001, she was receiving interferon 1a. 6 million units intramuscular weekly which was stopped in 2009 when she became pregnant. Anesthetic implications include assessment of neurological deficits with documentation pre- and postoperatively, awareness of side-effects, potential drug interactions of medications, selection of suitable techniques/anesthetic agents, neuromuscular monitoring-guided titration of non-depolarizing blocking agents with lowest necessary dose and avoidance of hyperthermia along with temperature, hemodynamic and respiratory monitoring. Lower concentrations of local anesthetic (LA) should be used for regional blocks keeping in mind the susceptibility of demyelinated neurons, to local anesthesia neurotoxicity. This is case report of successful anesthetic management of cesarean section.

INTRODUCTION

Multiple sclerosis (MS) is a rare demyelinating disorder of the central nervous system.[1] It is a complex human autoimmune- type disease with predominantly unknown etiology.[2] Numerous soluble mediators have been implicated[3] and these include interleukin (IL) 4, IL-6, IL-10, IL-12, IL-18, interferon (IFN) gamma, herpes-6 or Chlamydia pneumonia .

Immunologic destruction of the myelin brain protein (MBP) throughout the nervous system is the main pathology[2]. MS affects young adults, 20-40 yrs.; its course is unpredictable and runs over decades.[4] The demyelination seen in MS provides a permitting condition for axonal degeneration, which seems to be causative of permanent neurologic deficit.[4] Stress has been identified as one of the aggravating factors among others especially in the relapsing-remitting cases.

CASE REPORT

A 39 year old emirate female 36 weeks pregnant, with a history of multiple sclerosis since 1998 was admitted in Al Wasl hospital for safe confinement. She had 4 relapses till 2009 when she got pregnant. During each episode, she was treated with methyl prednisolone. Since 2001, she was receiving interferon 1a. 6 million units intramuscular weekly which was stopped in 2009. MRI in 2001 showed multiple plaques, the same was found in MRI 2009 and no spinal plaques. She recovered completely from each episode. Symptoms were usually diplopia, difficulty in vision, trigeminal neuralgia, facial palsy and ataxic gait. BAEP showed demyelinated lesion of right side of brain and lumbar puncture showed lymphocytosis but oligoclonal bands were negative.

She had a normal antenatal period during current pregnancy. Neurologist had advised intravenous immunoglobulin for 5 days postpartum. She was scheduled for normal delivery. Risks and benefits of regional anesthesia for labour analgesia as well as for cesarean section were explained to the patient. Neurological status was assessed and she had no autonomic or neurological deficits. Labour analgesia was induced with continuous epidural analgesia using bupivacaine 0.1% & fentanyl 2mcg/ml.at rate of 6-10 ml/hr, after a bolus of 8ml of same solution. She was taken for emergency cesarean section at 9cm due to severe acute fetal distress. Due to the urgency of the situation general anesthesia was chosen..Rapid sequence induction was done with propofol 180 mg and succinylcholine 75mg, maintenance with O_2, N_2O, sevoflurane and cisatracurium .Baby was delivered

with Apgar score of 6 at 1 minute and 10 at 5 minutes. Succinylcholine was used due to urgency of the case, although we know it is best to be avoided. The perioperative period was uneventful. She was extubated awake and for postoperative analgesia morphine 2.5 mg was given epidurally and catheter was removed. Patient was shifted to ICU for observation & monitoring. Post partum period was uneventful and no evidence of relapse.

DISCUSSION

Multiple sclerosis is a rare demyelinating disorder of the central nervous system.[1] It is a complex genetic disease associated with inflammation in the central nervous system white matter thought to be mediated by auto reactive T-cells.[6] Affected individuals have disseminated foci of demyelination in the brain and spinal cord[7]. The prevalence of MS disease ranges from 30 to 100 cases per 100000 individuals.[7]

Clinically, there are three main types:

- Relapsing-remitting: episodic symptoms with remissions (RRMS)
- Primary progressive: progressive neurologic deterioration without remissions.
- Secondary progressive: chronically progressive with remissions

Relapses or “attacks” typically present subacutely, with symptoms developing over hours to several days, persisting for several days or weeks, and then gradually dissipating[8]. The attacks are likely caused by the traffic of activated, myelin-reactive T cells into the CNS, causing acute inflammation with associated edema.[6] The ability of high dose steroids to quickly abrogate MS symptoms suggests that the acute edema and its subsequent resolution underlie the clinical relapse and the remission respectively.[8]

The outcome in patients with RRMS is variable; untreated, approximately 50% of all MS patients require the use of a walking aid within 10 years after clinical onset, [6] although the consequence on prognosis of newer treatment regiments is not as yet clear. Increased attack frequency and poor recovery from attacks in the first years of clinical disease predict a more rapid deterioration.[6] The primary progressive form of MS is characterized from the onset by the absence of acute attacks and instead involves a gradual clinical decline. Clinically, this form of the disease is associated with a lack of response to any form of immunotherapy.[10]

MS often occurs in young women, and the effect of pregnancy on the disease is poorly understood and infarct a matter of controversy.[11] In the Pregnancy in Multiple Sclerosis (PRIMS) study by Vukusic et al, it was found that there was a reduction in the relapse rate during pregnancy, in comparison to the year before pregnancy, especially marked in the third trimester, and a significant increase in the relapse rate in the first trimester post partum.[12] Care of pregnant women with MS is challenging because of the multiple physiological changes associated with pregnancy and the need to consider the impact of any intervention on the foetus.[13] In the absence of a specific immune-based assay, the diagnosis of MS continues to be based on the clinical history and neurological examination; that is, finding multiple lesions in time and space in the CNS. The use of MRI has had a major impact on allowing the early and more precise diagnosis of the disease[14]

Management of MS may be divided into two categories consisting of; 1) treatment designed to arrest the disease process and 2) symptomatic therapy. Immunosuppressive drugs remain the cornerstone of therapy in the first modality of treatment, although their efficacy is limited and their chronic use entails considerable problems. Glatiramer acetate mimics structure of myelin and serves a a decoy for antibodies while Interferon-β leads to immunomodulation. Symptomatic therapy consists of carbamezepine, phenytoin and gabapentin for paroxysmal pain, baclofen, diazepam and dantrolene for spasticity and anticholinergics for bladder and bowel disturbances. Antidepressants can be needed for depression. Currently Schwann cell transplantation is under investigation (2)

Literature regarding anesthetic management contains the use of general anesthesia (GA), spinal and epidural techniques. GA and epidural with low concentrations of local anesthetics are considered safe.[2,3,4].Demyelinated neurons appear susceptible to the neurotoxicity of local anesthetics, blockade might be aggravated and concentration and dose of local anesthetics is of concern[4,5,6] In relationto of GA no particular agent among induction agents or inhalation agents is preferred. [2,3]Succinylcholine is best avoided as it can produce hyperkalemia due to denervation sensitivity by upregulation of acetylcholine receptors. [2,3]The latter can also cause resistance to non-depolarizing blocking agents (NDBA).[7] Sensitivity to NDBAs can also be present due to muscle wasting and the use of medications such as baclofen

and dantrolene [3,8] Even a 0.5°C rise of temperature can slow the conduction along the demyelinated segment [2,3,4]resulting in relapse, hence maintenance of appropriate temperature in the operating theatre and temperature monitoring is essential.

CONCLUSION

The literature reveals certain pertinent facts concerning the relationship of multiple sclerosis and pregnancy.[5,13,14,15] The incidence and frequency of MS relapses are no greater in multipara than in nullipara. In the early stages, fertility is not altered. In mild cases, or in remissions, the pregnant patient does well. Pregnancy has no untoward effect on the course of the disease and the incidence of obstetric complication is not increased. The method of delivery depends entirely on obstetric considerations.[15]

The puerperium is uneventful and the infants are normal. The treatment is purely empiric and supportive, although ACTH and cortisone have been shown to have some effect in acute episode.

SUMMARY

A case of multiple sclerosis and pregnancy carried successfully to term is presented.

The etiologic theories, the diagnosis, and the therapy for the disease are discussed.
Our experience concurs with the opinion that pregnancy will usually proceed to an uneventful conclusion when multiple sclerosis is mild or in a state of remission. The optimal anesthetic management of MS requires careful preoperative assessment, awareness of perioperative hazards and the risk of postoperative exacerbations of MS.

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