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Research Paper

Anesthetic Concerns in a Patient With Myasthenia Gravis For Emergency Longitudinal Section Cesarean Section - A Case Report

[1]Dr. Abhijith VP (Junior resident), [2]Dr.Preetha J (Associate Professor),
[3]Dr. KR Radha (Professor and HOD)
Department of Anaesthesiology, Government Medical College, Kozhikode, Kerala, India

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I. INTRODUCTION :

Myasthenia gravis is an autoimmune disorder characterized by skeletal muscle weakness and fatigability, results from the destruction of post-synaptic nicotinic acetylcholine (ACh) receptors located at the neuromuscular junction (NMJ)[1]. The hallmark of myasthenia gravis is muscles weakness that exacerbates with activity and improves with rest. Many triggers exist, including stress, surgery, and pregnancy as well as ceratain drugs that can precipitate symptoms or lead to exacerbations[2]. The weakness often affects ocular muscles. Bulbar involvement is also common which will affect pharyngeal and laryngeal muscles. In some cases, it can affect respiratory muscles and proximal muscle groups[3].

Patients with myasthenia gravis is a challenge to anaesthesiologists because of the potential effects of anaesthesia and muscle relaxants on muscle weakness and respiratory function. We describe the anaesthetic management of a patient with myasthenia gravis for emergency cesarean section.

II. CASE REPORT:

The patient was a 37 year old third gravida ($G_3P_1L_1A_1$) with gestational age of 36 weeks and 2 days who had previously underwent cesarean section presented with active contractions. She was a known case of myasthenia gravis with symptoms first noticed at the age of 24 years. Initially she had an episode of ptosis and later she developed proximal muscle weakness which was noticed when she had difficulty in climbing stairs and overhead abduction of arm. She was then started on oral physostigmine and prednisolone. There is no history suggestive of respiratory muscle involvement until now. She had a history of spontaneous abortion 5 years back and history of cesarean section which was done under sub arachnoid block 4 years back.

On examination, patient was conscious and oriented. Neurological examination showed no significant abnormalities. Other organ systems were within normal limits. Blood investigations were within normal limits. Vitals were normal and room air saturation was 100%. Last meal was taken 6 hours back. IV access was maintained with two 18G cannulas.

Inj.Ranitidine 150mg and Inj.metoclopromide 10mg were given as premedication 30 minutes before induction. She was monitored with 5 lead ECG, non invasive blood pressure and SPO_2 in the operating room. Oxygen was administered with face mask at 5L/min. Under strict aseptic precautions, sub arachnoid block was given using a 23G Quince's needle with hyperbaric bupivacaine 0.5% 1.8 ml and buprenorphine 60mcg. Sensory level was assessed and was obtained up to T6 level. Surgery was then started and after delivery of baby, oxytocin infusion was started. Surgery lasted for about 40 minutes and level was assessed at the end of surgery and was recorded to be at T6 level. Patient was hemodynamically stable.

Patient was then shifted to PACU and was monitored for any respiratory distress or progression of weakness for 24 hours. Complete regression of block was seen after 3 hours. Regular dose of physostigmine was given after 2 hours. She was discharged on post operative day 5 without any significant complaints.

III. DISCUSSION:

Myasthenia gravis is an autoimmune disease that is characterised by muscle weakness and fatigue, is B-cell mediated, and is associated with antibodies directed against the acetylcholine receptor, muscle-specific kinase (MUSK), lipoprotein-related protein 4 (LRP4), or agrin in the postsynaptic membrane at the neuromuscular junction[1]. Disease incidence is most common in women in their twenties to thirties, whereas men show a bimodal age pattern, with a peak incidence in their thirties and again in their sixties. The course of the disease is marked by exacerbations and remissions. Many triggers of MG exist, including stress, surgery, and pregnancy as well as drugs (antibiotic, rheumatologic, cardiovascular) that can precipitate symptoms or lead to exacerbations[2].

The weakness often affects ocular muscles. Besides ocular symptoms like ptosis and diplopia, bulbar involvement is common, which will affect pharyngeal and laryngeal muscles. This can lead to issues with speech, dysphagia and increased risk of pulmonary aspiration. As the disease progresses, patients will often have proximal muscle group weakness and respiratory involvement. Patients are at increased risk for postoperative respiratory failure. Myasthenic crisis, an exacerbation of the disease which can cause significant diaphragmatic weakness requiring prolonged mechanical ventilation[3].

The course of the disease is unpredictable during pregnancy; however, worsening of symptoms occurs mostly during the first trimester and postpartum. MG can be managed during pregnancy with relatively safe and effective therapies. Anticholinesterase drugs are the mainstay of treatment. When symptoms are not well controlled, corticosteroids, azathioprine and in some cases cyclosporin A can be used[4]. Myasthenia gravis as such is not an indiacation for Caesarean section but many obstetricians prefer Caesarean section because of stress of prolonged labour and associated muscle tiredness of vaginal delivery[5]. MG during pregnancy can lead to serious life-threatening conditions, including respiratory insufficiency; therefore, intensive checkups by a gynaecologist and a neurologist are necessary[4].

Myasthenia gravis poses a number of challenges to the anesthesiologist. The choice of anesthesia will depend on several factors, including the patient's clinical condition, the urgency of the procedure, and the preferences of the anesthesia team. General anesthesia and regional anesthesia are both options, where bulbar involvement or respiratory compromise is the only true indication of general anaesthesia in these patients. The final decision will be made by the anesthesiologist in consultation with the patient[6].

Those with pulmonary or bulbar involvement are at increased risk for aspiration, and premedication with a proton pump inhibitor (PPI), histamine-2 (H2)-blocker, or prokinetic agent (i.e., metoclopramide) can be helpful. Avoidance of calcium channel blockers and magnesium is beneficial to help muscle contraction integrity[5].

Patients with MG are often more sensitive to the depressive respiratory effects of benzodiazepines and opiates.Due to the decreased amount of ACh available, these patients tend to be resistant to depolarizing neuromuscular blocking agents and very sensitive to the non-depolarizing neuromuscular blocking agents. neuromuscular monitoring may be used to assess the patient's muscle function and response to anesthesia. This monitoring helps the anesthesiologist adjust the dosage of muscle relaxants and ensure that the patient's muscles are adequately relaxed without causing excessive weakness. A continuos epidural can be used to control the sympathetic nervous system response to surgery and anesthesia and decrease the overall stress response[6][7].

When considering spinal anesthesia, the decision to use the same should be based on a thorough evaluation of the patient's condition. It is crucial for patients to continue taking their prescribed medications up until the day of surgery. This ensures optimal muscle function and helps to prevent exacerbation of symptoms during and after the procedure. However, spinal anesthesia can further contribute to muscle relaxation and weakness, potentially exacerbating respiratory compromise in individuals with already compromised respiratory function. Some individuals with MG may be more sensitive to the effects of local anesthetics used in spinal anesthesia which may cause excessive muscle weakness or adverse reactions. Spinal anesthesia can potentially affect autonomic function, leading to changes in blood pressure and heart rate. Monitoring of vital signs and appropriate management of any changes are necessary. Some medications used to manage MG, such as cholinesterase inhibitors (e.g., pyridostigmine), can interact with certain anesthetics or other drugs used during spinal anesthesia[7]-[10].

After surgery, close monitoring and appropriate post-operative care are crucial for individuals with MG. This may involve respiratory support, pain management, and careful monitoring for any signs of respiratory compromise or exacerbation of MG symptoms. Delayed emergence, residual muscle paralysis and respiratory failure needing prolonged ventilator support have also been reported as post operative complications[9][10].

IV. CONCLUSION:

Myasthenia gravis is a disease with enormous implications for the safe conduct of anaesthesia and peri operative management and therefore can be very challenging to the anaesthesiologist.Several studies have compared the use of general and regional anaesthesia in such patients although none have been found superior to other.With thorough pre-operative evaluation,continuing the daily anti-choline esterases,careful intra and post operative monitoring and anticipating respiratory compromise,the myasthenic patient can be managed safely.

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