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Case Report

Myasthenic Crisis and Preeclampsia with Severe Features in the Postpartum Period: A Case Report

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Abstract

This case report presents a 25-year-old gestational patient with a history of multiple cesarean sections, who developed a myasthenic crisis postpartum, complicated by preeclampsia with severe features. Despite unremarkable prenatal tests, the patient experienced respiratory failure requiring mechanical ventilation. Prompt neurological consultation led to the diagnosis of myasthenia gravis (MG) and initiation of appropriate treatment with intravenous immunoglobulins and Pyridostigmine. However, the contraindication of magnesium sulfate due to MG posed challenges in managing preeclampsia. The patient responded well to alternative antihypertensive therapy with hydralazine. This case underscores the importance of early recognition and management of MG in the peripartum period, as well as the need for multidisciplinary collaboration to optimize maternal and fetal outcomes in complex medical scenarios. Further research into alternative treatments for preeclampsia in MG patients is warranted to improve clinical management strategies.

Introduction:

The co-occurrence of myasthenia gravis (MG) and preeclampsia presents a unique and challenging clinical scenario, particularly in the peripartum period. We present a case of a 25-year-old gestational patient with a history of multiple cesarean sections who developed a myasthenic crisis shortly after delivery, complicated by preeclampsia with severe features. Despite lacking prior identification of MG symptoms during prenatal care, the patient experienced respiratory failure necessitating mechanical ventilation. Prompt neurological consultation led to the diagnosis of MG

and initiation of appropriate treatment. However, the contraindication of magnesium sulfate due to MG posed challenges in managing preeclampsia, requiring alternative antihypertensive therapy. This case highlights the importance of early recognition and multidisciplinary management of MG in the peripartum period, emphasizing the need for further research into alternative treatment strategies for preeclampsia in MG patients.

Keywords:

1. Myasthenic Crisis
2. Preeclampsia with Severe Features
3. Cesarean Section
4. Peripartum Management
5. Neuromuscular Disorders

Case description:

Case of a 25-year-old gestational patient G5P3013 with an intrauterine pregnancy (IUP) at 37 1/7 weeks gestational age who was admitted to labor and delivery (L&D) for repeat C-section with sterilization at the University District Hospital in San Juan, Puerto Rico. They had a history of three previous C-sections and a suspected uterine scar dehiscence during this pregnancy. On admission, fetal well-being tests prior to the cesarean section procedure were unremarkable. The patient was taking Metoprolol 25mg for management of a history of premature ventricular contractions. The patient had not presented with abnormal laboratory values during her pregnancy nor upon admission. The obstetric sonogram at admission showed a cephalic single living fetus, with an adequate amount of amniotic fluid index and adequate estimated fetal weight. Upon starting the procedure, general anesthesia was placed after failing to secure spinal anesthesia. The patient delivered a single living male baby with Apgar 9/9. The cesarean section was complicated by various adhesions necessitating intervention by general surgery for enetrolysis, small bowel resection, anastomosis, and appendectomy. Abdomen was closed by the obstetrics team on termination of surgical procedures.

During the post-operative period, the patient had symptomatic anemia for which they were transfused 2 PRBC. During this time, vital signs were remarkable for one measurement of elevated blood pressures at 143/91. On postoperative day #1, the patient began to develop dizziness and slurred speech, they were able to continue walking and tolerate regular food. Neurology service was consulted due to the patient's persistent weakness. It was noted that the patient had fatigability on sustained upward gaze, involuntary tongue protrusion, jaw weakness, and bilateral ptosis.

Neurology service recommended intravenous immunoglobulins (IVIG) 25mg for the first 4 days of treatment and then 20mg for one day, Pyridostigmine 30mg three times a day, Myasthenia gravis panel which included acetylcholinesterase receptor antibodies, a chest CT scan without contrast (to rule out a thymoma), and strict blood pressure control <140/90. Despite expedited management of symptoms, the patient continued to have slurred speech, weakness, and tachycardia. The patient developed respiratory failure for which rapid mechanical intubation was performed. Chest CT performed (Figure 1) showed bilateral multilobar infectious pneumonia; with more confluence and extension in the left lower lobe possibly compounded by aspiration pneumonitis. On POD 4 the patient began to have blood pressures in severity range 155-169/76-111. The patient was given a diagnosis of preeclampsia with severe features due to persistently elevated blood pressures in severity range. Due to magnesium sulfate being contraindicated due to causing respiratory depression in patients with myasthenia gravis, clinical decision was made to start the patient on IV hydralazine 10mg for control of these episodes and later switched to PO. At this time, as the patient was stable, she was not started on a seizure prophylactic medicine. The patient began to show improvement in weakness and fatigability after treatment was started with IVIGs. As blood pressure measurements improved, the patient regained movement in their extremities progressively. The patient extubated on postoperative day 8. The patient was discharged on day 9 with home medications for Pyridostigmine and prednisone.

Discussion:

We have presented a case of a patient who debuted with a myasthenic crisis accompanied by preeclampsia with severe features in the immediate postpartum period requiring intubation. Despite prior presentation of symptomatology including muscle weakness, the patient attributed symptoms to stress. Prior identification of symptoms was not gathered during prenatal care or past medical history. In this specific case, the patient was on beta blockers and underwent surgery under general anesthesia which are predisposing factors for exacerbations of MG. Beta blockers have been hypothyesized to impair neuromuscular junction synapsis causing difficulty in the travelling of muscular messages. (Krenn, 2020) Similarly, it has been established that stress may predispose or even cause a myasthenic crisis. (Neuman, 2022) By using paralytic agents in order to achieve general anesthesia, the sympathetic nervous system becomes activated, this in turn can lead to a myasthenic crisis. (Neuman, 2022) A diagnosis of MG was highly suspected only after thorough physical exam was performed by multiple physicians. Intubation and the development of preeclampsia with severe features in the post-partum period further complicated this case. Given that magnesium sulfate is a contraindication in cases of MG, options for treatment were limited. Hypertensive emergencies were successfully treated with 10mg of hydralazine IV and PO. Though

the patient did not require it in this case, she may have been placed on IV Levetiracetam for seizure prophylaxis. As the patient was stable, she was not started in this case. This case highlights both the importance of establishing alternative medications for management of preeclampsia with severe features in patients diagnosed with MG and the request for further initial surveillance during the peripartum period for autoimmune conditions through physical exam and detailed.

Myasthenia Gravis (MG) is an autoimmune condition that affects nearly 10-15 out of 100,000 people. (NIH, 2023) The hallmarks of Myasthenia Gravis are fluctuating muscular weakness and fatigue with exercise. (NIH, 2023) In 80% of cases, ocular involvement is the earliest symptom, including ptosis and diplopia. (NIH, 2023) Bulbar involvement is also seen in some patients with MG, manifesting as dysarthria, dysphagia, nasal speech, jaw weakness, fatigable chewing, and neck extensor weakness. (NIH, 2023) Also, this disease can affect breathing by causing weakness in the muscles used in respiration and, in more severe cases, respiratory failure. (NIH, 2023) Specifically, when this condition affects the diaphragm, there is a respiratory compromise, also called a Myasthenic Crisis. Notably, sensory involvement is not seen in MG. (NIH, 2023)

The pathophysiology of MG consists of several antibodies that attack components of the neuromuscular junction in the post-synaptic membrane, mainly the acetylcholine receptor (AChR). (Hughes, 2014) This attack by antibodies causes a decrease in the number of AChR at neuromuscular junctions, limiting the total interactions between acetylcholine and its intended receptor. (Hughes, 2014) There are different types of antibodies associated with Myasthenia Gravis. The anti-acetylcholine receptor (AChR) antibody is the most specific for generalized MG, though it may sometimes not be detectable in the early stages of the disease. (Hughes, 2014) The binding Anti-AChR ab is highly sensitive for both generalized and ocular MG. (Hughes, 2014) Other antibodies associated with MG are anti-striated muscle antibodies, anti-MuSK antibodies, Anti-lipoprotein protein four antibodies, and anti-agrin antibodies. (Hughes, 2014) Anti-striated muscle antibodies act against skeletal muscle components and are present in most patients with thymoma and MG under 40 years old. It is important to note that some patients may be seronegative for these antibodies, making diagnosis more elusive.

There are many treatments for myasthenia gravis, but no known cure exists. The first line of treatment consists of anticholinesterase medications, which is Pyridostigmine. (NHS, 2023) These slow the breakdown of acetylcholine at the neuromuscular junction (NMJ) and improve neuromuscular transmission, increasing muscle strength. (NHS, 2023) When a thymoma is present, a patient may undergo a thymectomy to remove the thymus gland, though this is deferred until the postpartum period. (NHS, 2023) Another available medication, eculizumab, acts by complement

inhibition and is activated as part of the immune response. (NHS, 2023) The FDA approved using eculizumab in adults with MG and positive AChR antibodies. Some immunosuppressive drugs such as prednisone, azathioprine, mycophenolate mofetil, and tacrolimus may improve muscle strength by suppressing the production of autoantibodies. (NIH, 2023) Plasmapheresis and intravenous immunoglobulins remove destructive antibodies that attack the NMJ. (NHS, 2023) They are only effective for a few weeks or months and are primarily indicated in acute settings. (NHS, 2023) Lastly, it is recommended that regular gentle exercise is performed as it may be helpful for some people with MG. (NIH, 2023) Some cases of MG may go into remission either temporarily or permanently with the complete disappearance of muscle weakness. (Hughes, 2014)

Despite having a high prevalence in biological females of childbearing age, MG has not been shown to affect fertility. (NIH, 2023) In general, MG symptoms have been improved during the second and third trimesters due to regular immunosuppressive changes occurring in late pregnancy. (NIH, 2023) Up to 40% of patients may have an exacerbation of the disease, which is more likely to occur in the first trimester or following delivery. (Waters, 2019) Reports do not suggest any adverse effect on pregnancy in patients with MG, such as spontaneous abortion or premature birth. (Waters, 2019) However, infants have been shown to develop transient neonatal MG, typically 2-4 days after birth. (Waters, 2019) Respiratory problems, muscle weakness, feeble cries, poor sucking, and ptosis characterize transient neonatal MG. (Waters, 2019) It usually reverses within three weeks without complications owing to the degradation of the antibodies derived from the pregnant person. (Waters, 2019) The uterus comprises smooth muscle, so ACh receptor antibodies do not affect it. (Waters, 2019) However, in some cases, patients may require assisted delivery due to myasthenia gravis effect on striated muscle. (Waters, 2019) There are no contraindications to vaginal delivery, and cesarean section should only be performed under obstetric indications. (Waters, 2019)

Few cases have been reported of both myasthenia gravis and preeclampsia with severe features. When these conditions present concomitantly, treatment may be challenging to choose, as administration of magnesium sulfate may exacerbate the myasthenic crisis. Ideally, patients should undergo a multidisciplinary evaluation during pregnancy in cases of known MG. This is the first presented case of a myasthenic crisis in a patient not previously diagnosed with MG and the development of preeclampsia with severe features.

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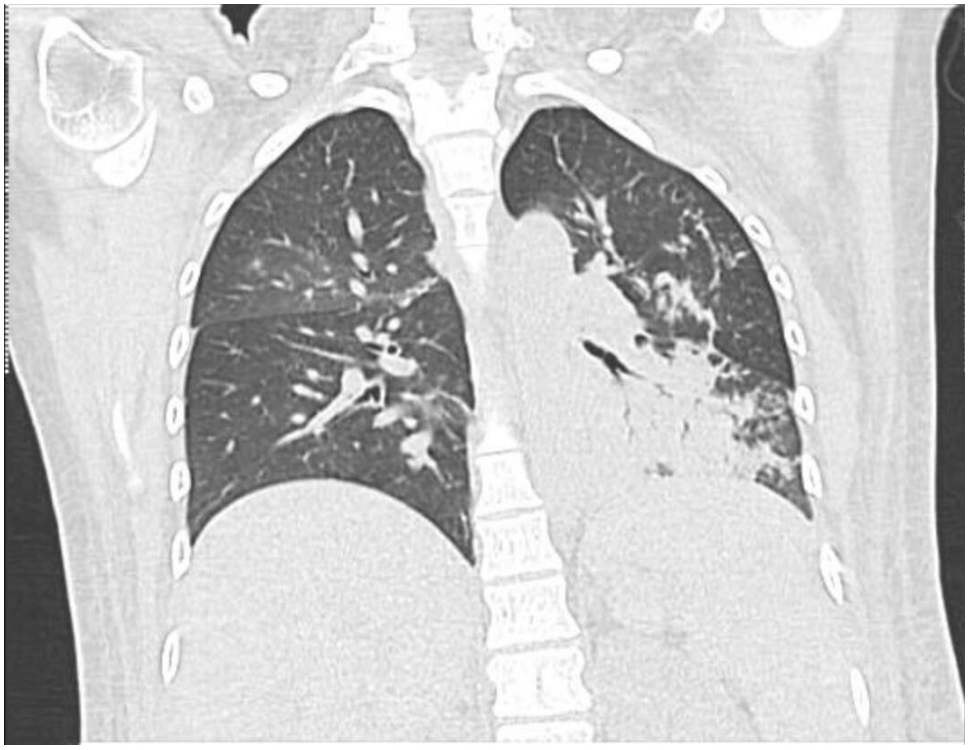
Figure 1: Visualized portions of the thyroid gland show homogeneous attenuation. Endotracheal tube slightly displaced. Abundant mucous, debris in the left main stem bronchus and lower lobe bronchi. Near complete consolidation of the left lower lobe. Additional patchy multifocal parenchymal opacities and consolidative foci in both upper lobes and right lower lobe. Trace bilateral pleural effusions.



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