Thai Journal of Obstetrics and Gynaecology
April 2009, Vol. 17, pp. 127-131

## CASE REPORT

# Myasthenic Crisis in Eclampsia: A Case Report

Chanvitya Punthumapol MD.

*Section of Obstetrics & Gynecology, Taksin Hospital, Bangkok 10600, Thailand*

**ABSTRACT**

Myasthenia gravis (MG) with eclampsia is a high risk condition. The use of magnesium sulfate to prevent seizure is contraindication because this may worsen MG and may develop myasthenic crisis. Myasthenic crisis results from weakness of upper airway muscles leading to obstruction and aspiration and / or weakness of respiratory muscles leading to reduced tidal volume. Termination of pregnancy, endotracheal intubation and mechanical ventilation, anticholinesterase drugs, corticosteroids, plasmapheresis, intravenous immunoglobulin and treatment of associated respiratory tract infections can improve the disease.

**Keywords:** myasthenic crisis, eclampsia

Myasthenic crisis may be defined as respiratory failure or delayed postoperative extubation for more than 24 hours resulting from myasthenic weakness. Myasthenic crisis results from weakness of upper airway muscles leading to obstruction and aspiration, weakness of respiratory muscles leading to reduced tidal volume, or from weakness of both muscle groups.[1]

## Case Report

The patient was a 25 years old, 2nd gravida with 1 child. She was referred from other hospital at 36 weeks pregnancy complicated with eclampsia and respiratory failure. She was known case of myasthenia gravis stage IIB (by Osserman classification)[2] and had been treated for 2½ years.

2½ years ago, the patient went to the other hospital with the chief complaint of ptosis for 1 year with difficult speaking and swallowing. She was diagnosed as myasthenia gravis and treated with pyridostigmine bromide and prednisolone. These gave her some relieves. She started antenatal care at 15th week of pregnancy and followed on appointments for 8 times with symptom of difficult swallowing. She had been treated with pyridostigmine bromide (60 mg) 4 times/day and prednisolone (5mg) 2 tablets once daily during pregnancy. The total weight gain was 4 kilograms at 35th week pregnancy. On admission, she had symptoms of chest discomfort and difficult swallowing without ptosis nor muscular weakness. Her blood pressure was 180/100 mmHg, urine albumin +2, pitting edema +1. She developed seizure symptoms and was treated with diluted magnesium sulfate 4 grams intravenous slowly and magnesium sulfate 10 grams diluted in 5% D/W 500 ml. intravenous

drips 50 ml per hour. Her oxygen saturation was 60 %, so she was on endotracheal tube and ambubag. She was referred to Taksin Hospital. She was delivered by cesarean section and tubal ligations due to eclampsia and unfavorable cervix under general anesthesia without using muscular relaxants. Her child was female, weighed 2200 grams, Apgar scores were 8 and 9 at 1 and 5 minutes respectively. The patient was admitted in intensive care unit (ICU) for continuous monitoring and respirator. On admission in the ICU, her blood pressure was 125/67mmHg, pulse rate was 85 beats per minute and respiratory rate was 16 times per minute. She was given nifedipine 5 mg every 6 hours, pyridostigmine bromide 60 mg every 4 hours and prednisolone (5 mg) 2 tablets once daily. Her chest x-rays showed infiltration of right lower lobe, so she was given ceftazidime 1 gm intravenous every 6 hours and clindamycin 600 mg intravenous every 8 hours for treatment of pneumonia. She could be taken off endotracheal tube on 14th day after operation without other severe complications. She was discharged from the hospital on 17th hospital day with blood pressure of 100/55 mmHg and treated with pyridostigmine bromide and prednisolone. Later the thymoma was found by CT scan at Siriraj Hospital and she was suggested to have thymomectomy.

While being in nursery, her child did not develop any symptoms of myasthenia gravis. The child had only hypocalcemia (serum calcium 7.6 mg/dl.) and was treated by intravenous diluted calcium gluconate. The child was discharged on 7th day after birth.

## Discussion

Myasthenia gravis (MG) is an autoimmune neuromuscular disorder manifested clinically as weakness and easy fatiquability of skeletal muscle groups particularly of the face and extremities without reflex, sensory or coordination abnormalities.[3,4] It is coursed by interference in the conduction of nerve impulse across the myoneural junction due to antibodies directed against the acetylcholine receptor (AChR) and leads to muscular weakness.[3,5] The prevalence of MG is 1 in 10,000 to 1 in 50,000.[6] The incidence of MG is 4-6 per million per year.[7] MG can affect both sexes at all ages, but twice as many female as male patients and its incidence peaks in the 3rd decade of life.[8,9,10] AChR antibodies are present in 85% of patients with MG. Detection of elevated levels of AChR binding antibodies is the most specific test for MG.[11] MG may progress to involve the bulbar muscles used in swallowing, articulation and chewing. In more severe cases, the breathing muscles can be involved causing shortness of breath.[4,5] Repetitive exercise demonstrates rapid loss of muscle strength which can be restored with anticholinesterase drugs. Injection of 2 to 10 mg of edrophonium (Tensilon test) results in prompt restoration of strength to involved skeletal muscle.[3]

The course of MG is highly variable and unpredictable in pregnancy.[10,12] Both myasthenic mother and her child are considerable increased risk during pregnancy.[5] Nausea and vomiting in early pregnancy can lead to subtherapeutic levels of medication requiring parenteral therepy. These make the patient to be worsen in her pregnancy and disease. The physical stress of labor and delivery increase myasthenic weakness. MG results in an increase in maternal mortality, morbidity, pregnancy wastage and premature labor.[3] The risk of premature rupture of membrane was 3 times and cesarean section was 2 times higher in the MG group compared to the normal pregnancy.[9] Risks to the fetus are prematurity, joint contractures and neonatal myasthenia. The perinatal death rate is 68 per 1,000 live births.[4]

This patient was known case of MG with pregnancy at 36 weeks. On admission, she had symptoms of chest discomfort and difficult swallowing without ptosis nor muscular weakness and developed eclampsia. She was treated with magnesium sulfate and developed respiratory failure. She was on endotracheal tube and respirated with ambubag and was referred to Taksin Hospital. She had myasthenic crisis which precipitated with magnesium sulfate. Magnesium sulfate is used in

obstetrics for the prevention of eclamptic convulsions and for uterine tocolysis. Magnesium diminishes the depolarizing action of acetylcholine, reduces transmitter substances at the motor end-plate, and depresses muscle membrane excitability. Magnesium sulfate is a contraindicated pharmacologic agent in myasthenic patient.[3] Phenobarbital and phenytoin may be used in myasthenic patients with preeclampsia.[4,13] An increased risk of preeclampsia has not been demonstrated among myasthenic patients.[4]

Operative delivery is a particularly hazardous time for the myasthenic mother. Cesarean section should be performed on myasthenic mother only for clear obstetric indications.[3,6] Because of eclampsia and unfavorable cervix, this patient was terminated pregnancy by cesarean section under general anesthesia without using muscle relaxants. Myasthenics are very sensitive to non-depolarizing muscular relaxants. Curare or succinylcholine is controversial agents for the anesthetic management of myasthenics. Ether, chloroform, trichlorethylene and fluothane are contraindicationed in myasthenic patients.[3] Local or regional anesthesia is preferred, but general anesthesia may be used without using muscular relaxants.[14] Endotracheal general anesthesia is recommended for cesarean section in myasthenics with bulbar or respiratory involvement for better control of airway, oxygenation and secretions.[4,13]

Myasthenic crisis is defined as an exacerbation of myasthenic symptoms that requires mechanical ventilatory supports. It is often precipitated by the stress of surgery, infectious diseases, obstetric delivery or change in anticholinesterase medication.[15] Myasthenic crisis results from weakness of upper airway muscles and/or respiratory muscles leading to obstruction and aspiration. Indications for intubation and mechanical ventilatory supports include evidence of fatique with increasing tachypnea and declining tidal volumes, hypoxemia despite supplemental oxygen, hypercapnea, and difficulty with secretions.[1] Precipitating factors were bronchopulmonary infections (29%) and aspiration (10%), sepsis, surgical procedures, rapid tapering of immune modulation, pregnancy, exposure to drugs that may increase myasthenic weakness (magnesium salts).[1] Exacerbations during pregnancy are 41% and most common in the puerperium.[3] Infections play a key role in the development of severe exacerbations in myasthenic mothers. It was the most common primary precipitant of the crisis occurring in 65%.[15] This patient was admitted in ICU for respiratory supports and antibiotics to treat aspirated pneumonia and pyridostigmine. Pyridostigmine bromide at the dose of less than 600 mg/day may be used safely during pregnancy and compatible with breastfeeding. Corticosteroids can be used safely during lactation.[12] In this patient, the MG showed a marked exacerbation from magnesium sulfate and infection. After closed observations and cared in ICU, she could be taken off endotracheal tube on 14$^{th}$ day after operation without other severe complications.

This patient was found thymoma by CT scan at Siriraj Hospital and was suggested to have thymomectomy. MG associated with a thymoma, particularly in older patients, carries a poor prognosis.[10] Thymectomy was benificial for myasthenic patients with satisfactory remission and improvement rates.[4,16]

Plasmapheresis is an effective treatment for MG. Improvement following plasmapheresis occurs within a few days, much faster than other immunomodulating therapies. The effects of a course of plasmapheresis last only several weeks. Plasmapheresis produces large fluid shifts and patients are susceptible to hypotension and myocardial infarction.[17]

Intravenous immunoglobulin (IVIg) has the response rate 60-70 % and improvement occurred within days to weeks. IVIg has fewer side effects comparing to plasmapheresis.[17]

Neonatal myasthenia gravis (NMG) is a transient disorder of the newborn of myasthenic mother caused by the passive transfer of antibodies from mother to infant. Myasthenic signs in the newborn include flat faces, weak suckling, feeble

cry and respiratory distress. All of these signs respond promptly to parenteral anticholinesterase drugs.[3,4] It was reported in 9% of newborns whose mother had MG.[18] All newborns of myasthenic mothers should be observed carefully during the first few days post partum for signs of muscular weakness and impaired bulbar and respiratory function.[8] The symptoms usually disappear within a few weeks after birth and do not recur.[11] The perinatal mortality from NMG is 8-10%.[4] NMG does not correlate with maternal disease severity or maternal anti-AChR antibody titers.[4,9,18] Maternal anti-AChR antibodies may pass to the infant through breast milk and accentuate NMG. It seems appropriate to avoid breast-feeding in the presence of a postpartum myasthenic exacerbation, high titers of anti-AChR antibodies, or in infants with proven sensitivity to maternal anticholinesterase ingestion.[4] This patient was suggested to avoid breast-feeding. Her child did not develop any symptom of myasthenia gravis and was discharged on 7th day after birth.

This patient showed that MG in eclampsia was a high risk condition. The use of magnesium sulfate to treat or prevent seizure is contraindication because this may worsen MG and may develop myasthenic crisis, which is life threatened condition. Termination of pregnancy, respiratory supports, anticholinesterase drugs, cortcosteroids and treatment of associated infections especially respiratory tract infections can improve the disease.

## References


1. Juel VC. Myasthenia gravis: Management of myasthenic crisis and perioperative care. Semin Neurol 2004;24:75-81.
2. Phillips LH. The epidemiology of myasthenia gravis. Semin Neurol 2004; 24: 17-20.
3. Plauche WC. Myasthenia gravis in mothers and their newborns. Clin Obstet Gynecol 1991;34:82-99.
4. Stafford IP, Dildy GA. Myasthenia gravis and pregnancy. Clin Obstet Gynecol 2005;48:48-56.
5. Jackson CE. The effect of myasthenia gravis on pregnancy and the newborn. Neurology 2003;61:1459-60.
6. Ferroro S, Pretta S, Nicoletti A, Petrera P, Ragni N. Myasthenia gravis: management issues during pregnancy. Eur J Obstet Gynecol Reprod Biol 2005;121:129-38.
7. Harper CM. Congenital myasthenic syndromes. Semin Neurol 2004;24:111-23.
8. Tellez-Zenteno JF, Hernandez-Ronquillo L, Salinas V, Estanol B, Silva OD. Myasthenia gravis and pregnancy: clinical implications and neonatal outcome. BMC Musculoskelet Disord 2004;5:42.
9. Ciafaloni E, Massey JM. Myasthenia gravis and pregnancy. Neurol Clin 2004;22:771-82.
10. Thanvi BR, Lo TCN. Update on myasthenia gravis. Postgrad Med J 2004;80:690-700.
11. Meriggioli MN, Sanders DB. Myasthenia gravis: diagnosis. Semin Neurol 2004;24:31-9.
12. Ciafaloni E, Massey JM. Management of myasthenia gravis in pregnancy. Semin Neurol 2004;24:95-100.
13. Mueksch JN, Stevens WA. Undiagnosed myasthenia gravis masquerading as eclampsia. Int J Obstet Anesth. 2007;16:379-82.
14. Dillon FX. Anesthesia issues in the perioperative management of myasthenia gravis. Semin Neurol 2004;24:83-94.
15. Murthy J MK, Meena AK, Chowdary G VS, Naryanan Jaishree T. Myasthenic crisis: clinical features, complications and mortality. Neurol India 2005;53:37-40.
16. Witoonpanich R, Dejthevaporn C, Srisinroongruang T, Subhannachart W, Attanavanich S, Boonkasem S, et al. Long-term outcome and factors influencing the outcome of thymectomy for myasthenia gravis. J Med Assoc Thai 2004;87:1172-5.
17. Saperstein DS, Barohn RJ. Management of myasthenia gravis. Semin Neurol 2004;24:41-8.
18. Batocchi AP, Majolini L, Evoli A, Lino MM, Minisci C, Tonali P. Course and treatment of myasthenia gravis during pregnancy. Neurology 1999;52:447-52.

# *รายงานผู้ป่วยโรคกล้ามเนื้ออ่อนแรงชนิดฉุกเฉินในโรคพิษแห่งครรภ์ระยะชัก*

***ชาญวิทย์ พันธุมะผล***

*ภาวะโรคกล้ามเนื้ออ่อนแรงร่วมกับโรคพิษแห่งครรภ์ระยะชักเป็นภาวะที่มีความเสี่ยงสูง การใช้ยาแมกนีเซียมซัลเฟตเพื่อป้องกันหรือรักษาอาการชักถือเป็นสิ่งต้องห้าม เนื่องจากยาดังกล่าวอาจทำให้อาการของโรคกล้ามเนื้ออ่อนแรงแย่ลง และอาจนำไปสู่อาการโรคกล้ามเนื้ออ่อนแรงชนิดฉุกเฉินได้ โรคกล้ามเนื้ออ่อนแรงชนิดฉุกเฉินนี้เป็นผลมาจากการอ่อนแรงของกล้ามเนื้อทางเดินหายใจตอนบน ทำให้เกิดการอุดตันของทางเดินหายใจและสำลักอาหารเข้าสู่ทางเดินหายใจได้ และ/หรือการอ่อนแรงของกล้ามเนื้อเกี่ยวกับการหายใจทำให้เกิดการลดลงของ tidal volume ได้ การทำให้การตั้งครรภ์สิ้นสุด การใส่ท่อหายใจและการใช้เครื่องช่วยในการหายใจ การให้ยาต้านโคลีนเอสเตอเรส (anticholinesterase) การให้ยาคอร์ติโคสเตอรอย plasmapheresis, intravenous immunoglobulin และการรักษาภาวะการติดเชื้อของระบบทางเดินหายใจที่พบร่วมด้วยสามารถช่วยให้โรคนี้ดีขึ้นได้*