Case Report : Generalized Myasthenia Gravis

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Abstract

Generalized myasthenia gravis is a rare case of autoimmune wherein the antibodies destroy the post-sinaptic acetylcholine receptors at skeletal muscle's neuromuscular junctions. The clinical presentation is specific distributin of motoric deficit without sensoric deficit which diminished with rest and worsens with excessive use. We report a case of a woman 52 yo with symptoms of ptosis, diplopia and dificulty of swallowing. Repetitive nerve stimulation showed >10% decrement and prostigmin test was positive. The patient was treated and showed clinical improvement.

Introduction

Myasthenia gravis is a rare case of autoimmune in which the antibodies destroy the post-sinaptic acetylcholine receptors at skeletal muscle's neuromuscular junctions. It has a prevalence of 1.7-21.3 out of 1.000.000 people. The incidence is higher on women than men in ≤ 50 years old community (7:3), yet at >50 years old, men have more risk (3:2)[1]. Clinically, myasthenia gravis is divided into 2 subgroup : ocular and generalized. Patients with ocular myasthenia gravis only present with diplopia and ptosis. On the other hand, generalized myasthenia manifested as extraocular symptoms such as dysphonia, dysphagia, and even dyspnea[1,2].

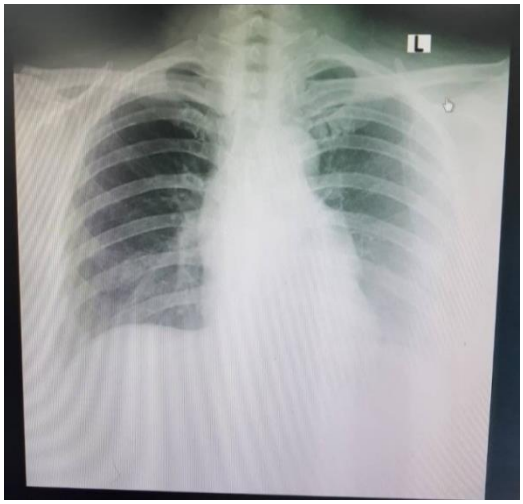
Case

In this case, 52 year old woman came to our outpatient department with difficulty of opening her right eye since 10 days ago which worsens gradually within 3 days. She also had diificulty gazing right and up, causing her to turn her neck. She could not see clearly due to double vision. She also had nasally and slurred speech, difficulty swallowing liquid and using straws hence often getting choked, diificulty chewing and closing her jaws since 2 months ago. All of her symptoms were getting worse at mid-day after activity, yet diminished with rest. She usually felt fine when she woke up in the morning. There was no limb or generalized weakness, dysarthria, pain, tingling, nor difficulty of breath.

Patient and family members never had similar symptoms. She had a history of uncontrolled hypertension and diabetes mellitus. She did not smoke but became a passive smoker. She rarely consumed tinned food.

Physical examination showed high blood pressure 140/90 mmHg. Cranial nerve examination showed she had heavy right eye ptosis 4mm/1mm. She also had 3rd, 6th, 7th, and 9th cranial nerve paresis. Specific wartenberg, simpson and counting tests were done and the results were positive. The patient had no sensoric dysfunction. Limb motoric and deep tendon reflexes were normal. Meningeal signs and pathological reflexes were not found.

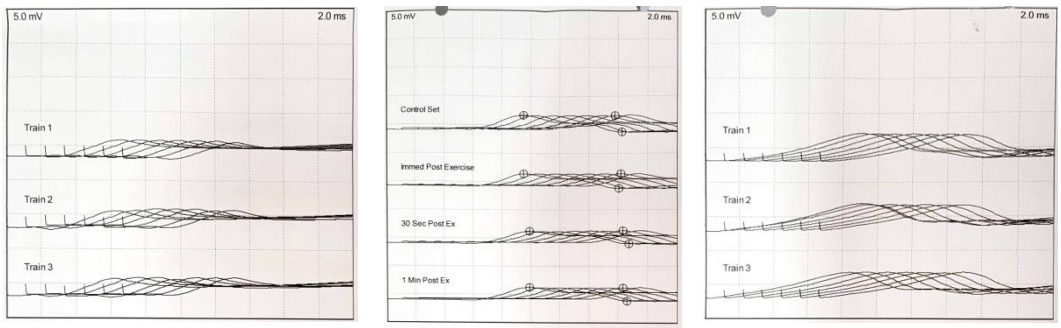
The patient was diagnosed with generalized myasthenia gravis and further diagnostic tests were done. Chest xray was done, no abnormality was found other than aorta elongation. Blood test was done and showed normal result. The patient was admitted into the ward. She was given ramipril and metformin. In order to prevent masking effect, myasthenia gravis medication was not given yet.



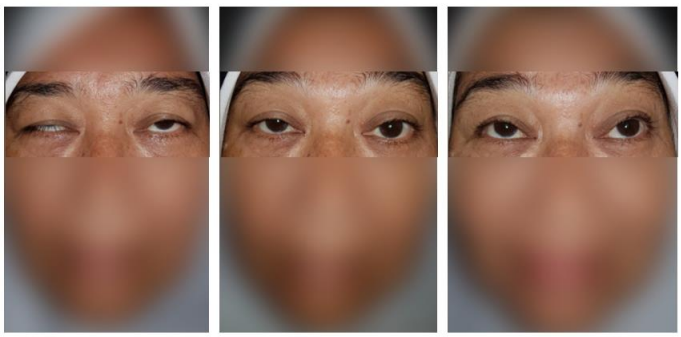
Picture 1. Chest postero-anterior Xray with aorta elongation.

On the next day, the patient could see without double vision and speak normally. She could also drink from a water bottle without choking. However, she still had difficulty opening her right eye. She had her period the day before. Physical exam showed improvement of her ptosis 3mm/1mm. Her HbA1C test showed uncontrolled diabetes mellitus. Repetitive nerve stimulation test result was decrement >10% and prostigmin test was positive confirming myasthenia gravis diagnosis. She was given pyridostigmine 60 mg three times a day.

On the following day, the patient had significant improvement of her ptosis 2mm/1mm. Her previous symptoms have diminished. She was admitted out of the ward with a control appoinment at next week.



Picture 2. Repetitive Nerve Stimulation Test (from left to right): A) Right orb oculi, B) Median Repetitive Stimulation, C) Right trapezius repetitive stimulation test



Picture 3. Right eye ptosis (from left to right): A) Before treatment, B) The first day after treatment, C) The second day after treatment.

Discussion

Muscle motoric weakness without sensory and deep tendon reflexes deficit which worsens with repetitive use and diminished with rest is a specific symptom of myasthenia gravis. In this patient, the acetycholine receptor (AChR) in post-synaptic membrane at neuromuscular junction was decreased. This phenomenon was due to the autoimmune response mediated by the anti- AChR by 3 mechanisms : AChR turnover acceleration, AChR active location blockade and damage at post-synaptic muscle membrane[2]. The neuromuscular junction of myasthenic patient had swallow post-synaptic folds and wide synaptic cleft. These mechanisms reduced the eficiency of her neuromuscular transmission, hence causing muscular weakness. The number of released acethylcholine (ACh) will be reduced during repetitive activity (presynaptic rundown), thus causing the patient felt healthy in the morning and became weak after repetitive activity (myasthenic fatigue).

The patient was diagnosed as generalized myasthenic gravis because aside from ocular symptoms, she also had bulbar symptoms. According to her story, she had the first symptoms since 2 months ago. Her disease exacerbated 10 days ago due to stress and excessive physical activity. Wartenberg, simpson and counting tests were special physical exam to narrow down the diagnosis. Ice pack eye test is a useful bedside test that can aid in the differentiation of MG and should have been done[3]. It is a cheap, safe, and quick test. The test consists of the application of covered ice to the eyes for 2-5 minutes. If positive, the patient no longer has diplopia or a raise of 2 mm of the palpebral fissure. The mechanism behind this test is that by cooling the tissues, more specifically the skeletal muscle fibres, the activity of the acetylcholinesterases are inhibited. Myasthenic Gravis Composite (MGC) scale should have also been done in order to assess the clinical severity of this patient. Increase of ≥ 3 points of MGC scale showed significant clinical improvement[4].

Laboratory examination played an important role in diagnosing myasthenia gravis. The current gold standard are anti-AChR and anti-MuSK antibody tests. Antibody testing was not done due to limitation of source.

Decremental > 10-15% in repetitive nerve stimulation test can be found in myasthenia gravis patient. Prostigmin test was done by intramuscular injection of 3cc prostigmin methysulphate and diminished clinical symptoms showed positive result.

There were diabetes mellitus and hypertension as comorbids. The relationship between myasthenia gravis and diabetes mellitus was still unclear. However, myasthenia gravis treatment might induced diabetes mellitus[5]. Yet, in this case, the patient had diabetes mellitus before she received corticosteroid treatment. On the other hand, myasthenia gravis might cause diffuse cholinergic dysfunction, hence causing autonomic dysfunction. This mechanism might have increased the patient's risk for hypertension[6].

The differential diagnoses of this patient were Lambert-Eaton Myasthenic Syndrome (LEMS), botulism and intracranial mass lession. However, repetitive nerve stimulation test showed incremental results in LEMS, botulism patients present with autonomic symptoms, and intracranial nerve lesion might present with vomiting and other neurological deficits.

According to myasthenia gravis algorithm, patients should receive pyridostigmine as first line drug. Pyridostigmine inhibits acetylcholinesterase in the synaptic cleft thus slowing down the hydrolysis of acetylcholine. If symptoms persisted, clinicians should evaluate for thymectomy[7]. Neck CT scan should have been done to detect thymoma. If the patient refused or symptoms still persisted, immunosuppresive drugs should have been given[8,9].

The patient's prognosis was good. However, most myasthenia gravis patients did not have full remission[2]. Patients should be educated to avoid exacerbating factors. Patient should also be told regarding myasthenic crisis symptoms and management.

Conclusion

Generalized myasthenia gravis is a rare disease. The primary management are anti-acethylcholinesterase drugs. Early diagnosis and treatment might increase patient's chance for full remission.

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