Myasthenia Gravis

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Key points

- Myasthenia gravis (MG) is a neuromuscular transmission disorder
- Muscle fatigue and weakness
- Blood samples for acetylcholine receptor (AChR) binding antibodies and striational antibodies
- Acetyl cholinesterase inhibitors

Definition

Myasthenia gravis (MG) is a neuromuscular transmission disorder caused by antibodies. It is characterized by the weakness and exhaustion of the voluntary muscles. The blood of the majority of patients has been found to contain antibodies that target the acetylcholine gated sodium ion transport protein.

It is an autoimmune condition in which patients have immunity to their own acetylcholine activated ion channels. Regardless of the underlying cause, the end plate potentials that arise in the muscle fibers are typically too weak to stimulate the muscle fibers. If the illness is severe enough, the patient will eventually pass away from paralysis, specifically from respiratory muscle paralysis.1

Clinical features of myasthenia gravis

Patients typically have a history of muscle fatigue and weakness during prolonged or repeated activity, which usually gets better after rest. The signs and symptoms change from day to day and hour to hour, but typically include increased weakness from exertion, hot weather, infections, emotional distress, and certain drugs.

In myasthenia gravis, weakness typically develops in a craniocaudal direction.

Dyspnea can occur during physical activity or while at rest due to intercostal and diaphragmatic weakness. Diaphragmatic paradox and orthopnea with quick resolution when sitting up are significant clinical indicators of neuromuscular breathlessness.

Breathlessness can appear suddenly over the course of hours, so these patients should be closely watched and have their forced vital capacity regularly measured.

Patients with severe conditions might need mechanical ventilation and intubation.

When weakness varies from day to day or over extended periods of time, it can be challenging to make an objective assessment.

Characteristic clinical features of Myasthenia Gravis:

- With a typical bimodal peak that typically has a first peak in the third decade and a second peak in the sixth and seventh decades (hence the phrase "young women and old men"), this condition can manifest at any age.
- The main characteristics are weakness and exhaustion of the voluntary muscles. Exertion makes symptoms worse or worsens them; rest or anticholinesterases can help. Symptoms usually worsen later in the day, with a typical diurnal variation.
- In about 10% of patients, ocular muscle weakness presents initially and may persist as the only symptom. Lengthy upward gaze towards a fixed target for one minute aggravates ptosis (and diplopia).
- In most cases, weakness progresses from ocular muscles to involve other muscles in a craniocaudal direction. The weakness of intercostal muscles and diaphragm leads to dyspnea on exertion or at rest. The orthopnea with rapid resolution on sitting up and diaphragmatic paradox are important clinical signs of neuromuscular breathlessness.
- Deep tendon reflexes are intact or may be brisk.
- There are no objective sensory deficits.In severe cases, respiratory failure may ensue, needing intubation and mechanical ventilation.
- Symptoms may fluctuate and there may be remissions of variable periods, particularly at early stages.2

The diagnostic process:

Blood samples for acetylcholine receptor (AChR) binding antibodies and striational antibodies should be obtained once the clinical diagnosis of MG has been determined. The latter is mostly collected in order to improve diagnostic yield in late-onset MG and to screen for thymoma in younger

patients. The majority of the time, these tests take up to 10 days to get findings. If the patient shows clear eyelid ptosis or ophthalmoparesis that can be serially followed, a provisional diagnosis may be obtained with the edrophonium test. Using electrophysiological testing, a more accurate diagnosis can be made.3

The most specialized diagnostic method for the condition is serum autoantibody determination. For patients who are seronegative and need a differential diagnosis to distinguish myasthenia gravis from other neuromuscular transmission disorders, electromyography (EMG) and the clinical response to cholinesterase inhibitors are crucial for confirming the diagnosis.3

Treatment strategies for generalized myasthenia gravis:

The vast majority of MG patients get better over time with treatment. Many people can enter remission or a minimal manifestation state. The benefits of receiving care in specialized facilities are probably greatest for patients who are refractory. A complete remission is characterized by the absence of all symptoms and signs and the cessation of all medications for two years. Pharmacologic remission is defined as the absence of symptoms or signs for two years while taking stable doses of medication. Although there are no symptoms, the minimal manifestation status may still include minor clinical indicators like weak hip flexors or orbicularis oculi.

Acetyl cholinesterase inhibitors are the first line of treatment. The patient should be given thymectomy consideration concurrently. It's probably time to start corticosteroid therapy if a patient is still symptomatic after taking pyridostigmine. Thymectomy, corticosteroids, and acetyl cholinesterase inhibitors as being the first-line treatments for generalized MG.4

References

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