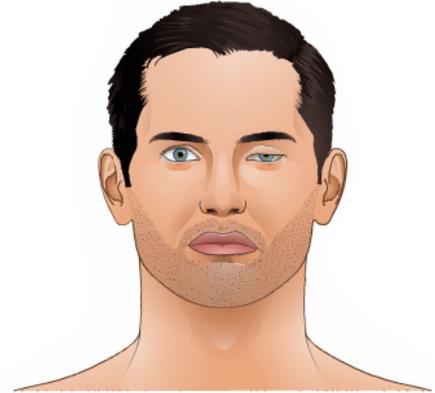


Myasthenia Gravis

Introduction

Myasthenia gravis is a disease that causes the muscles to become weak. Medication is available to treat myasthenia gravis. But medical emergencies can arise if the disease affects the breathing muscles.

This reference summary discusses myasthenia gravis. It covers causes, symptoms, and treatment options.



Myasthenia Gravis

Myasthenia gravis is a disease that causes weakness in the voluntary muscles of the body. This muscle weakness usually happens during periods of activity and improves after periods of rest.

Certain muscles, such as the ones controlling eye movement, facial expression, chewing, talking and swallowing are often involved in myasthenia gravis. Myasthenia gravis may also affect the muscles that control neck and limb movement and breathing.

Myasthenia gravis means grave muscle weakness. But due to recent advances in medicine, most cases of myasthenia gravis are not as serious as they used to be.

Myasthenia gravis is not contagious or fatal and does not affect life expectancy. Myasthenia gravis most commonly affects women under the age of 40 and men over the age of 60. But it can happen to anyone.

Causes

The body has two kinds of muscles:

- Voluntary muscles.
- Involuntary muscles.

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We directly control voluntary muscles to make the body walk, run, write, lift, smile, and chew.

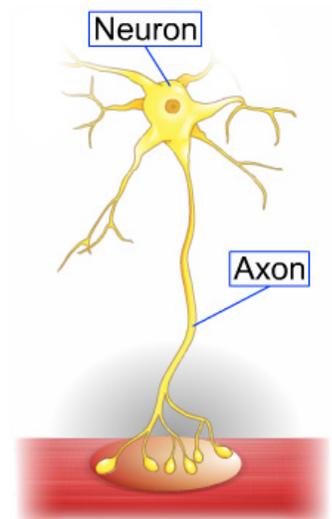
Involuntary muscles work on their own. These muscles are found in the:

- Blood vessels.
- Colon.
- Intestines.
- Stomach.

The brain controls voluntary muscles by sending messages through the nerves. Messages go from the brain to the spinal cord, then through peripheral nerves to the muscles.

Nerves are made of cells called neurons. A neuron has a long fiber called an axon that electrical impulses travel through. When messages from the brain arrive at the end of a nerve, they are transmitted to the muscle. The space between a nerve ending and a muscle is called a neuromuscular junction.

As messages arrive to the neuromuscular junction from the brain in the form of electrical waves, they release chemicals called neurotransmitters. A neurotransmitter, a chemical called acetylcholine, locks into special keyholes called receptors when it reaches the muscle side of a junction. Locking acetylcholine into the receptors causes the muscles to contract.



The nerves will not be able to control muscle contractions if anything interferes with the steps needed to transmit brain messages across a neuromuscular junction.

Myasthenia gravis happens when normal communication between nerves and muscles is interrupted at the neuromuscular junction. The interruption is due to antibodies. Antibodies are substances made by the body's immune system to fight germs and infections. They prevent acetylcholine from reaching the muscles by destroying or blocking the receptors.

The thymus is important in the development of the immune system early in life. The thymus is a small gland located under the breastbone. In adults with myasthenia gravis, the thymus gland may be abnormal. Some patients with myasthenia gravis develop tumors in the thymus gland. These tumors are usually non-cancerous.

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Although the relationship between the thymus gland and myasthenia gravis is not clear, scientists think the thymus gland may be responsible for the immune system attacking acetylcholine receptors.

Symptoms

Myasthenia gravis may affect any voluntary muscle. However, the muscles that are most commonly affected are those that control:

- The eye and eyelid movement.
- Facial expressions.
- Swallowing.

Myasthenia gravis may happen suddenly. In most cases, the first noticeable symptom is weakness of the eye muscles that causes double vision. In some cases, difficulty swallowing and slurred speech may be the first signs.

The degree of muscle weakness involved in myasthenia gravis varies greatly among patients. Symptoms may include:

- A change in facial expressions.
- Unstable or waddling walk.
- Weakness in arms, hands, fingers, legs and neck.
- Difficulty swallowing.
- Impaired speech.
- Shortness of breath.

A myasthenic crisis happens when weakness affects the muscles that control breathing. This creates a medical emergency where the patient needs a respirator in order to breathe.

In patients whose respiratory muscles are weak, myasthenic crises may be triggered by:

- Emotional stress.
- Fever.
- Infection.
- Side effects of medication.

Myasthenia gravis tends to progress slowly and treatment is often successful. It does not affect life expectancy.



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Diagnosis

Your health care provider will ask about your medical history and perform a physical exam. Your health care provider will do a neurological exam. Myasthenia is suspected if:

- Your eye movements are impaired.
- Your muscles are weak but you can still feel things normally.

During a neurological exam, your health care provider will ask questions and do tests to check your brain, spinal cord, and nerve functions.

Several tests can confirm the diagnosis of myasthenia gravis. A blood test can detect high levels of the antibodies responsible for attacking the acetylcholine receptors.



Another test is called the edrophonium test. If a myasthenia gravis patient with eye weakness is given edrophonium chloride, muscle weakness will be relieved within a few minutes.

Your health care provider may also do an electrodiagnostic examination. This studies the function of your nerves and muscles.

Your health care provider may do tests to check for an abnormal thymus gland. These tests may include:

- A CT scan. A CT, or computer tomography, scan, takes a series of detailed x-ray pictures of the inside of your body.
- An MRI. An MRI, or magnetic resonance imaging, uses radio waves and magnetic to create detailed pictures of the inside of your body.

Your health care provider may do a pulmonary function testing, or PFT. A PFT measures breathing strength. It also helps predict whether respiration may fail and lead to a myasthenic crisis.

Treatment

Myasthenia gravis can be controlled with medication. Some medications help improve neuromuscular transmission and increase muscle strength.

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These medications work by slowing down the breakdown of acetylcholine in the neuromuscular junction. The acetylcholine therefore stays longer in the area needed and results in an increased chance to stimulate the muscle.

Other medications limit the production of antibodies. These are known as immunosuppressive drugs.

Surgery may be done to remove an abnormal thymus gland. This surgical procedure is called a thymectomy. It may help improve the control of myasthenia gravis. It is usually recommended for patients younger than 60 years of age. Older patients do not tend to benefit as much from a thymectomy.



For some patients, removing the antibodies from the blood can be helpful. This procedure is called plasmapheresis.

Another treatment consists in giving the patient high-dose intravenous immune globulin, which temporarily modifies the immune system and provides the body with normal antibodies from donated blood. This is known as IVIG.

The doctor determines which treatment option is best for each patient. This depends on several factors including:

- How severe the weakness is.
- Which muscles are affected.
- The patient's age and medical condition.

Summary

Myasthenia gravis is a disease that causes weakness in the voluntary muscles of the body. This muscle weakness usually happens during periods of activity and improves after periods of rest.

Certain muscles, such as the ones controlling eye movement, facial expression, chewing, talking and swallowing are often affected by myasthenia gravis.

Myasthenia gravis is not contagious. It most commonly affects women under the age of 40 and men over the age of 60. But it can happen to anyone.

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Symptoms of myasthenia gravis may include:

- A change in facial expressions.
- Unstable or waddling walk.
- Weakness in arms, hands, fingers, legs and neck.

Myasthenia gravis tends to progress slowly. It usually starts in the eye muscles.

Treatment for myasthenia gravis is available and effective. There are several different medications that can help control myasthenia gravis. In some cases, surgery to remove the thymus gland may also help.

Most patients with myasthenia gravis can expect to live healthy normal lives with close to normal activity levels.



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