

Myasthenia Gravis

Definition

Myasthenia gravis (MG) is a **chronic** (long-lasting) **neuromuscular** disease, which affects both nerves and muscles. The disease limits the action of **acetylcholine (ACh)**, a chemical in the body that helps transfer information from the nerves to muscles.

People with MG have an **immune system** (the interrelated parts of the body that fight infection) that does not work properly. It causes the body to make **antibodies** (cells that protect the body) that wrongly destroy the ability of muscle to receive ACh. Nerve signals are kept from reaching muscle tissues, and muscles become weak or quickly fatigued.

Cause

The exact cause of MG is not known. Experts suspect a genetic factor, in which people may be more likely to develop MG if they have a relative with an **autoimmune disorder** (where the immune system that does not work properly, as in MG).

In many patients, MG is linked with a tumor or growth of the **thymus**, a small gland in the chest that plays a role in immune response. Babies of mothers with MG may show symptoms after birth due to being exposed to their mother's antibodies.

MG can occur in anyone, but is seen most often in women younger than 40 years old, and in men over 60 years old. It is also much more common in women than in men.

Symptoms

MG affects the muscles that are used voluntarily. The more often a muscle is used, the more likely it is that a person with MG will have muscle fatigue.

Symptoms of MG can include:

- Drooping eyelids and blurry vision.
- Difficulty talking, chewing, or swallowing.
- Weakness in the arms and legs.
- Shortness of breath.

Very young babies may show the following symptoms:

- Poor feeding.
- Appear floppy, without muscle tone.
- Breathing difficulty.

Complications

Emergency care may be required when breathing or swallowing becomes very difficult. People who have even minor trouble with swallowing are at risk of choking. The symptoms of MG can also worsen during respiratory infection or times of stress.

Diagnosis

A doctor may suspect MG in a patient who complains of muscle weakness that improves after rest. The patient may be referred to a **neurologist**, a doctor who is trained to detect and treat diseases of the nervous system.

Tests done by a neurologist for a correct diagnosis of MG may include:

- **Neurological examination.** This is done to test patient reflexes, muscle strength, coordination, balance, and mental ability.
- **Edrophinium test.** Edrophinium is a drug that helps protect ACh, the chemical that carries signals from the nerves to muscle. A brief improvement of symptoms after an edrophinium injection suggests a strong chance of MG.
- **Nerve conduction studies and electromyography.** During this test, a small electrical impulse is applied to the skin to stimulate the nerves. This causes the muscle to contract, and the strength of the contraction is measured. Next, a tiny **electrode** (a metal device that conducts electricity) is inserted into the muscle to measure patterns of electrical activity during muscle rest and contraction.
- Blood tests may be done to confirm the presence of antibodies involved in MG, and rule out other illness.

Treatment

There is no cure for MG at this time, and the goal of treatment is to manage patient symptoms. Treatment options can include one or more of the following:

- Medication. **Pyridostigmine** can enhance communication between the nerves and muscles. Several drugs suppress the immune system to reduce activity. For example, **corticosteroids** limit the number of antibodies made. However, corticosteroids are not safe for use over long periods of time. Drugs such as **cyclophosphamide, cyclosporine, or azathioprine** are more often prescribed for long-term treatment.
- **Plasmapheresis.** This is a treatment in which blood is cycled out of the body and filtered to remove harmful antibodies.
- **Immune Globulin.** This **intravenous** (also called **IV**) treatment gives the patient healthy antibodies and alters the harmful immune system response.
- **Thymectomy.** Removal of the thymus gland often improves MG symptoms. However, doctors do not recommend this surgery for people 60 years of age and older.

Prognosis (Expectations)

While MG cannot be cured, it can enter **remission** (when symptoms go away for a period of time). Some patients have complete remission after a thymectomy.

Overall, patients who properly manage MG with the necessary medication and supportive therapy are expected to live a normal life span.

Tips

In addition to medical treatment, patients can take steps to help cope with the symptoms of MG. These include:

- Planning to do physical tasks and have meals when energy is greatest, often an hour or so after taking medication.
- Using electric or battery-powered tools when possible, to save energy.
- Wearing an eye patch for vision problems.
- Keeping walking space free of clutter and cords.
- Installing support rails in areas like the bathtub or stairways.

For More Information

For more information on myasthenia gravis, contact the following resources:

Myasthenia Gravis Foundation of America

1821 University Ave. W
Suite S256
St. Paul, MN 55104
Phone: (651) 917-6256
Toll-free: (800) 541-5454
Fax: (651) 917-1835
Email: mgfa@myasthenia.org
Web: <http://www.myasthenia.org>

National Institute of Neurological Disorders and Stroke

P.O. Box 5801
Bethesda, MD 20824
Phone: (301) 496-5751
Toll-free: (800) 352-9424
TTY: (301) 468-5981
Web: <http://www.ninds.nih.gov>

National Organization for Rare Disorders (NORD)

P.O. Box 1968
55 Kenosia Avenue
Danbury, CT 06813-1968
Phone: (203) 744-0100
Fax: (203) 798-2291
Web: <http://www.rarediseases.org>
Email: orphan@rarediseases.org

References:

Mayo clinic

www.mayoclinic.com

National Institute of Neurological Disorders and Stroke

www.ninds.nih.org

Key words:

myasthenia gravis, autoimmune, acetylcholine, edrophinium, nerve conduction, electromyography, plasmaphoresis, thymus, thymectomy, autoimmune, immune globulin, immunoglobulin