

Myasthenia Gravis

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BASIC INFORMATION

Description

Myasthenia gravis (MG) is a neurologic condition that is caused by abnormal transmission of information (impulses) from nerves to muscles resulting from a chemical blockage at the nerve endings. MG causes variable degrees of muscle weakness.

Causes

MG occurs in both congenital and acquired forms, with the acquired form being more common. Congenital MG arises from a defect in the muscle receptor at the nerve ending that is present at birth. It occurs in the Jack Russell terrier, English springer spaniel, and smooth fox terrier.

In acquired MG, the body's immune system produces antibodies (autoimmune disease) that block the chemical reaction at the nerve ending. Consequently, a muscle contraction cannot be generated, and muscle weakness develops. In most instances, the inciting cause of acquired MG is not identified; however, certain cancers, such as thymoma, can cause MG.

Clinical Signs

Three forms of MG are recognized, and each may produce different clinical signs:

- *Focal MG* causes muscle weakness in only one area, such as the esophagus. A weak esophagus becomes dilated (megaesophagus) and does not transfer food to the stomach well. Pneumonia can occur from regurgitation and inhalation (aspiration) of food into the lungs. Difficulty breathing, coughing, decreased appetite, lethargy, fever, and regurgitation are common signs. Focal MG may also involve the muscles of the face, back of the mouth, and larynx, causing decreased ability to blink, swallow food and water, or bark.
- *Generalized MG* involves all the muscles in the body. Affected animals become tired when walking and often can only walk a few steps before needing to rest. As they fatigue, their gait becomes short and choppy. The dog may be reluctant to move at all or may sit or lie down after a few steps. Following a rest, the gait may briefly return to normal. Generalized MG may also affect the esophagus.
- *Fulminant MG* is the most severe form and causes sudden onset of generalized weakness, with inability to walk. These dogs usually also have megaesophagus and frequently regurgitate. They may be so weak that they cannot breathe normally.

Diagnostic Tests

Acquired MG may be suspected based on the history and clinical signs. A definitive diagnosis is made with a blood test that identifies

antibodies against the receptor on muscles that binds the chemical acetylcholine. A Tensilon test can be considered while results of the antibody titer are awaited. It involves giving the drug, edrophonium chloride (*Tensilon*), to determine whether it will temporarily improve the signs of weakness. Not all dogs with MG respond to this drug, and sometimes the test is positive in animals without MG.

Other laboratory tests are often recommended to rule out other diseases that can cause muscle weakness. Chest x-rays may be done to look for megaesophagus, pneumonia, and other problems, such as a thymoma. Electrocardiograms and other tests may be recommended to rule out heart disease as a source of the weakness.

Congenital MG is suspected in young animals that show weakness from birth. Definitive diagnosis requires a muscle biopsy.

TREATMENT AND FOLLOW-UP

Treatment Options

Drugs are given that increase the amount of acetylcholine in the nerve ending so that muscle strength is increased. Pyridostigmine bromide (*Mestinon*) may be given orally, or neostigmine bromide (*Prostigmin*) may be injected in dogs that cannot swallow. Sometimes steroids or other immune suppressive drugs are given in an attempt to stop the production of antibodies, but these are used cautiously in dogs with pneumonia.

Aspiration pneumonia is treated with antibiotics for several weeks. Animals with megaesophagus may require insertion of feeding tubes or feeding from an elevated position to decrease regurgitation. (See also the handout on **Megaesophagus**.) Severely affected dogs often require hospitalization and supportive care. Frequent medication adjustments may be needed at the start of treatment. Treatment for other underlying problems (thymoma) may also be started.

Follow-up Care

Frequent recheck visits are needed to evaluate response to treatment and adjust medications. Long-term follow-up is also required. Laboratory tests and x-rays may be repeated periodically.

Prognosis

Prognosis is good for animals that are mildly affected and show rapid improvement with initial treatment. Although many animals with acquired MG completely recover, some do not respond to therapy. Other dogs improve but signs recur during times of stress, such as after vaccination or surgery. Resolution of the disease is documented by a normal antibody titer and physical examination. Dogs with severe aspiration pneumonia, fulminant MG, congenital MG, or thymoma, have a worse prognosis and may not survive.