

## MYASTHENIA GRAVIS IN A LABRADOR RETRIEVER DOG – CASE PRESENTATION

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### Abstract

*The patient, Labrador Retriever, male, eight years old, was presented at veterinary doctor showing muscle weakness, walked heavily on hind limbs and muscle contractions. The first signs of muscle weakness appeared five months ago, they have progressively worsened and 14 days before the consult it stopped barking. No changes were observed in biochemical and hematological blood tests as well as imaging examinations, but the neurological examination revealed the decrease of spinal reflexes in all four limbs. Myasthenia gravis was suspected and the diagnosis was based on clinical signs and the favorable response to administration of neostigmine 1mg / kg intravenously.*

**Key words:** myasthenia gravis, muscle fatigue, neostigmine

### INTRODUCTION

Myasthenia gravis is an autoimmune, neuromuscular disorder and it is manifested by an attack against acetylcholine receptors from the post-synaptic membrane of the neuro-motor plaque, causing their degradation or blockage, resulting in motor deficiency and skeletal muscle weakness. (Burns, 2010, Hotineanu and Stasiuc 2010, Marx et al., 2015, Thomas, 2014).

It may have genetic determinism or can be acquired ( Bexfield et al.,2006, Dissanayake et al.,2016, Herder et al.,2017).

Myasthenia gravis is characterized by a decrease in the number of acetylcholine receptors (AchR) from the postsynaptic muscular membrane and by flattening or simplifying postsynaptic fold crests. These defects lead to a diminished efficacy of neuromuscular transmission, and even if normal AchR release occurs, the post-synaptic potentials produced are of low power and do not trigger the potentials of muscle fiber action, resulting in insufficient transmission of information in a significant number of neuromuscular junctions, which leads to the weakness of muscle contraction. Neuromuscular abnormalities of myasthenia gravis are induced by an autoimmune response mediated by specific anti-AchR antibodies. These antibodies reduce the number of AchR available in muscle

junctions through three different mechanisms: AchR can be degraded more rapidly through a mechanism involving their cross-coupling followed by accelerated endocytosis; the active sites of AchR, where they normally bind to Ach, may be blocked by antibodies, the postsynaptic muscle membrane may be damaged by complement-associated antibodies (Bexfield et al., 2006, Ciobanu, 2011).

Symptomatology of myasthenia gravis is clinically expressed by abnormal weakness of volunteer muscles at resting restraining with restoration to rest, ocular signs (palpitations), dysphagia with nasal regurgitation of liquids, fallout of the mandible, weakening of the neck and neck muscles, weakening of the pelvis, difficulty walking (Dissanayake et al. 2016, Fraser et al., 1970, Shelton, 2016). However, muscle weakness is not always associated with physical effort. Muscular weakness at the facial, pharyngeal or esophageal level is common, and in many situations there is a mega-esophagus in the absence of generalized muscular weakness (focal myasthenia), so megaesophagus may be a primary affection or a symptom (Thomas, 2014).

Paraclinic investigations are an indispensable adjunct to the clinical examination, in many cases having diagnostic certainty (Fraser et al., 1970).

Myasthenia gravis occurs with a higher frequency in adult dogs, especially in the

German Shepherd, Golden Retriever and Labrador Retriever, Jack Russell Terrier (Blakey et al., 2017) and is rare in cats (Shelton, 2016).

Diagnosis is often delayed, due to the rare frequency of the disorder and due to manifestations that may be confused with various metabolic or neurological pathologies (Ciobanu, 2011).

Antibodies to acetylcholine receptors can be detected in the serum of sick animals by indirect immunohistopathological examination using normal muscle as a substrate (Marx et al., 2015, Thomas 2014), the diagnosis of certainty is established after detection of antibodies in the serum, but about 2% of cases with generalized myasthenia gravis may be seronegative (Shelton, 2002).

The most common complications are regurgitation and aspiration pneumonia (Thomas 2014).

Generalized muscle weakness disappears rapidly after i.v. of edrophonium chloride (0.1-0.2 mg / kg), and this treatment is often used as a diagnostic test. Administration of short-acting anticholinesterase (edrophonium chloride) produces a dramatic increase in muscle strength (Thomas 2014).

Treatment consists of administering long-acting anticholinesterase and immunosuppressive for the chronic condition. The treatment is anticholinesterase drugs - pyridostigmine (1-3 mg / kg, PO, bid-tid) or neostigmine (0.04 mg / kg, SC, qid). Immunosuppressive doses of prednisolone and other immunity-modulatory drugs are recommended in animals that do not respond to anti-hemostasis and / or chronic disease. Prognosis is usually good, and in many cases remission is spontaneous, and is proven by lowering the antibody titer. Prognosis is reserved for animals with persistent muscle weakness or aspiration pneumonia, which is the leading cause of death or euthanasia (Atiba et al., 2014, Thomas 2014).

## MATERIALS AND METHODS

In November 2017, a Labrador, 8, year-old, chocolate colored dog, was presented at the FMVB Medical Clinic for showing changes in the rear train and no improvement in anti-inflammatory treatments for the past 4-5

months. The patient lives in and out of the house and has a 9-year-old Labrador female partner. It is not castrated and was vaccinated until it was 5 years of age, internally and externally deworming. The clinical examination was performed and it was revealed that the voice was altered, the owner stating that it was not barking, trying, but it sounds very raucous. It tired quickly.

The neurological examination revealed:

- status: present,
- consumption: cheerful
- posture: prefers decubitus in the sterno-abdominal
- cranial nerves: fallen inferior eyelids, "menace" reaction delayed in both eyes
- panniculus delayed on both sides
- normal perianal reflex
- normal spinal flashes, but the hind limbs trembled
- proprioception - in the "robber" and "flexion-extension" examinations, the reactions were delayed and difficult.

When examining walking:

- kyphosis,
- walks a few steps then sits,
- intolerance to effort. It takes a few steps and then sits down. Walking gets harder and harder, the rear train's muscles get tense and the dog starts jumping, then it sits on the hind limbs, then lateral or abdominal decubitus.

Diagnosis: suspicion of myasthenia gravis based on exercise intolerance and fatigue while walking.

## RESULTS AND DISCUSSIONS

With symptomatic, supportive and immunosuppressive treatment in case of adverse response to symptomatic treatment, prognosis is favorable (Gilhus and Verschuuren, 2015).

The therapeutic trial with myosin (neostigmine bromide) was performed intravenously. 3 minutes after administration, the patient walked normal.

The therapeutic trial is used in human medicine and commonly used in veterinary medicine to diagnose myasthenia gravis (Gilhus and Verschuuren, 2015). The patient progressed favorably and therapy was instituted with Mestinon cp 60 mg, 1 mg / kg at 6 h p.o.

Supportive treatment has been recommended for mild physical activity and a diet to prevent weight gain. At the following check-up, it has been found that it was walking normal, but it also had slightly dropped eyelids. Continued treatment with Mestinon 60 mg, 1 mg / kg at 8 hours and moderate physical activity. After 3 months it returns to control and investigation.

## CONCLUSIONS

Radiological imaging should be performed as soon as possible after the occurrence of clinical signs to exclude megahexophagus. Symptomatic treatment with neostigmine bromide will be instituted immediately, for the patients to have a good quality of life. Doses are based on the body's response to treatment, paying attention to the side effects of the drug. The patient should be monitored periodically. The diagnostic and treatment algorithm should include the in-situ strict examination of patients with myasthenia gravis in order to institute effective treatment.

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