



Autoimmune Myasthenia Gravis: Diagnosis and Management in a Young Patient Seen for Consultation at the National Reference General Hospital of N'Djamena (Chad)

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Abstract

Introduction: Myasthenia gravis is a neuromuscular junction disorder characterized by fatigability, muscle weakness affecting the oculomotor, bulbar, and skeletal muscles, worsening with exertion and resolving at rest. It is an autoimmune neurological disease that can be life-threatening due to respiratory muscle damage. **Clinical Case:** This is a 20-year-old male XL patient with no particular history who presents with muscle fatigue during exercise associated with bilateral ptosis, predominantly on the right. These symptoms have been evolving for 2 months. The neurological examination found a myasthenic score of 85/100 with bilateral ptosis and tetraparesis. The ENMG, looking for a decrement by repetitive stimulation at 3 c/s, revealed a significant decrement of 5% in the proximal muscles (facial-orbital nerve pair) and distal muscles (median nerve-breast adductor pollicis). The electrophysiological examination (ENMG), key to the diagnosis of myasthenia gravis, was carried out on our patient, objectifying a decrement. **Discussion:** In our series, our patient is 20 years old. The literature informs us that myasthenia gravis begins at any age, from 6 months to over 80 years, but mainly affects adults under 40 years, the majority of whom are women. The normality of the ENMG should not exclude the diagnosis of myasthenia gravis. In the study of our patient, the ENMG showed a decrease. Indeed, the dosage of anti-RACH and anti-MUSK

antibodies was carried out abroad without showing any particularities. The negativity of anti-RACH antibodies often leads to the search for anti-MUSK antibodies. The treatment consists of anticholinergics, namely pyridostigmine bromide (Mestinon 60 mg), with a gradual increase in doses depending on the case to reach a minimum effective dose in order to avoid muscarinic side effects. Indeed, anticholinergics are the first-line treatment for myasthenia gravis, increasing the amount of acetylcholine at the motor endplate and its effectiveness in all forms of myasthenia gravis. Given the persistence of muscle fatigue during exercise, a course of corticosteroid therapy was used, initially as a bolus for 5 days at a dose of 250 mg in 250 mL of isotonic serum to be administered over 30 minutes in association with adjuvant treatment (albendazole 400 mg as a single dose, calcium and potassium supplementation, and omeprazole 20 mg), followed by oral corticosteroid therapy at 0.5 or 1 mg/kg. Treatment with an immunosuppressant (azathioprine) was proposed, given the persistence of clinical signs. **Conclusion:** Myasthenia gravis, which is the most common autoimmune disease of the neuromuscular junction. It is rare in Sub-Saharan Africa in the literature; it should not be overlooked because of the life-threatening risk caused by damage to the respiratory and swallowing muscles, resulting in an impact on daily life with muscular fatigue during exercise.

Subject Areas

Immunology, Neurology

Keywords

Myasthenia Gravis, Autoimmune, N'Djamena, HGRN

1. Introduction

Myasthenia gravis is a neuromuscular junction disorder characterized by fatigability, muscle weakness affecting the oculomotor, bulbar and skeletal muscles, worsening with exertion and resolving at rest [1]. It is an autoimmune neurological disease that can be life-threatening due to damage to the respiratory muscles [2]. Our observation allows us to highlight the characteristics, the difficulty of diagnosis and management of this condition in our country, most often requiring the use of medical evacuations.

2. Observation

This is a 20-year-old male XL patient with no particular history who presents with muscle fatigue during exercise associated with bilateral ptosis, predominantly on the right. These symptoms have been evolving for 2 months. The neurological examination found a myasthenic score of 85/100 with bilateral ptosis and tetraparesis.

Myasthenic score is a quantitative assessment tool of disease severity and response to treatment [3].

A score of 85/100 on the Garches Myasthenia Gravis score indicates mild to moderate myasthenia gravis. This score, ranging from 0 to 100, where 100 represents the absence of symptoms, means that the patient has symptoms of myasthenia gravis, but that these are not very severe. A lower score would indicate more severe myasthenia gravis.

A score of 100 means that the patient has no symptoms of myasthenia gravis, while a score of 0 indicates very severe myasthenia gravis with maximum impairment of all functions.

A score of 85 indicates that the patient has symptoms, but they are relatively limited and do not significantly interfere with daily activities.

ENMG looking for decrement by repetitive stimulation at 3 c/s revealed a significant decrement at 5% on the proximal muscles (facial-orbital nerve pair) and distal muscles (median nerve-short adductor pollicis) (**Figure 1**).

Anti-RACH and MUSK antibodies were negative, chest CT revealed a well-defined homogeneous mass in the anterior mediastinum enhanced after injection of contrast agent, suggesting a thymoma (**Figure 2**), and the immunological assessment (antinuclear antibody, native DNA, T4, T3, TSH) was without abnormality. Progressive ocular myasthenia gravis without respiratory involvement (Osserman stage II A) or swallowing disorder was suspected and he benefited from several therapeutic protocols. The Osserman classification is an essential tool for the management of myasthenia gravis, allowing an accurate assessment of severity, prediction of progression and appropriate therapeutic orientation [3]. The Osserman classification makes it possible to determine whether the myasthenia gravis is mainly ocular (limited to the eye muscles) or generalized (affecting other muscles) and how severe it is. It also guides the choice of treatment, such as the choice between anticholinesterase drugs, immunosuppressants, or thymectomy (removal of the thymus) [3].

1) Osserman's classification divides myasthenia gravis into five classes:

Class I: Ocular myasthenia gravis limited to the eye muscles (ptosis, diplopia).

Class II: Mild to moderate generalized myasthenia gravis, with involvement of the eye muscles and other muscles, but without myasthenic crisis.

IIA: Mild generalized myasthenia gravis.

IIB: Moderate generalized myasthenia gravis.

Class III: Severe generalized myasthenia gravis, with involvement of the eye muscles and other muscles, and the possibility of myasthenic crisis.

Class IV: Myasthenia gravis, with severe muscle weakness, often accompanied by respiratory problems.

Class V: Myasthenia gravis with myasthenic crisis, requiring respiratory assistance.

Anticholinergics such as Mestinon 60 mg 1 tablet every 6 hours, combined with boluses of methylprednisolone 250 mg in 250 mL of isotonic saline for 5 days, have

resulted in a clinical improvement of a few weeks. In view of the worsening of signs with the appearance of dysphagia without aspiration, dysphonia (Osserman stage IIB).

2) Management of myasthenia gravis has seen significant advances, particularly with the arrival of new therapies and improved treatment strategies.

Current treatments aim to achieve remission of symptoms and combine symptomatic drugs (such as anticholinesterases) and immunomodulators.

For forms resistant to conventional treatments, we have recent reviews on second-line therapies: rituximab, ciclosporin, tacrolimus and cyclophosphamide can be considered and Intravenous immunoglobulins (IVIg) or Plasma exchanges are used urgently to treat attacks [4]. Note that we do not have plasmapheresis sessions by centrifugation technique in Ndjamena, Chad, for the flare-up and rituximab (anti-CD20) is exorbitant; she continued with Mestinon 1 tablet every 6 hours. There was a regression of symptoms for two weeks, then a resurgence of ocular signs. A medical evacuation abroad was carried out urgently and the ENMG with jitter showed a decrease to 47%. She benefited from a thymectomy abroad, treatment based on immunosuppressants (Azathioprine IMUREL 50 mg) at a dosage of 1 tablet per day, then followed by Mestinon 60 mg 1 tablet per day. The clinical evolution was favorable and he resumed his activities.

3. Discussion

Patients consult several doctors without the diagnosis being established. These are generally general practitioners who are less experienced in diagnosing this rare condition. The diagnosis was suggested and subsequently confirmed through the limited technical platform. In our series, our patient is 20 years old. The literature informs us that myasthenia gravis begins at any age, from 6 months to over 80 years old, but mainly affects adults under 40 years old, the majority of whom are women [5]-[7]. Men in later forms from the sixth decade become the majority. In our practice environment, which is poor in paraclinical examination, the clinic remains the main diagnostic tool. Indeed, the first manifestations are purely ocular, taking the form of ptosis and/or diplopia. Oh *et al.* in their study found a high incidence of ocular manifestations, *i.e.*, 85.1% for ptosis and 37% for diplopia [8]. Heckmann *et al.* show that black subjects were more likely than whites to develop ophthalmology and complete ptosis [9]. After one year of evolution in 80% to 90% of patients have other territories that are affected, such as the pharyngolaryngeal muscles. On the other hand, the involvement of the respiratory muscles and the severe swallowing disorders characterizing the severe forms (20 to 30% of patients in the literature) were observed in our patient [10] [11]. The electrophysiological examination (ENMG), key to the diagnosis of myasthenia gravis, was carried out in our patient, objectifying a decrement (**Figure 1**). It seems that the technique used and more particularly. The choice of the nerve-muscle pairs explored considerably varies the sensitivity of this examination [8]. Indeed, 8 nerve-muscle couples are described in the literature (fibular-tibial, anterior ra-

dial-Anconeus, spinal-trapezius, facial-nasal or facial-orbicularis oculi, the muscles of the floor of the mouth in case of phonation or swallowing disorders and the median-short abductor of the thumb or short ulnar nerve abductor of the five fingers). The choice of couples corresponds to our daily practice: the facial-orbicularis oculi or median-short abductor nerve couples, even if the radial nerve-Anconeus muscle and spinal-trapezius muscle couples, which are classically the most sensitive, are described in reference [8]. Stimulation of the facial nerve/nasal muscle is an easily achievable technique and recommended as a first-line treatment in ocular and generalized myasthenia gravis [12]. The absence in our practice environment of the Jitter study, which allows a fine evaluation of neuromuscular transmission at the level of the motor unit, could explain the false negatives [13]. The lack of availability of equipment (ENMG) and the absence of qualified human resources forced us to evacuate patients to countries with more advanced technologies. The normality of the ENMG should not exclude the diagnosis of myasthenia [13]. In the study of our patient, the ENMG showed a decrease (Figure 1). Indeed, the dosage of anti-RACH and anti-MUSK antibodies was carried out abroad without showing any particularities. The negativity of anti-RACH antibodies often leads to the search for anti-MUSK antibodies [6] [7]. In generalized myasthenia, anti-RACH antibodies are present in 80% of cases and absent in 20% of cases [5]. A thymoma may be associated in 20 to 30% of cases. We noted the presence of thymoma in our patient on chest CT (Figure 2). The role of the thymus and the T cell immune system in the initiation and modulation of anti-RACH Ab production is still debated but appears to be important [9]. Myasthenia gravis in the incidence of myasthenia gravis in patients with thymoma is, according to several authors, more severe than in patients without thymoma [2] [14]. The association of myasthenia gravis with other autoimmune pathologies has been found in the literature [12]. The literature suggests a possible role of genetic factors in the development of autoimmune diseases. Treatment consists of anticholinergics, *i.e.*, pyridostigmine bromide (Mestinon 60 mg), with a gradual increase in doses depending on the case to reach a minimum effective dose in order to avoid muscarinic side effects. Indeed, anticholinergics are the first-line treatment for myasthenia gravis, increasing the amount of acetylcholine at the motor endplate and its effectiveness in all forms of myasthenia gravis [2]. Given the persistence of muscle fatigue during exercise, a course of corticosteroid therapy was initially administered as a bolus for 5 days at a dose of 250 mg in 250 mL of isotonic serum to be administered over 30 minutes in association with adjuvant treatment (albendazole 400 mg as a single dose, calcium and potassium supplementation, and omeprazole 20 mg), followed by oral corticosteroid therapy at 0.5 or 1 mg/kg. Treatment with an immunosuppressant (azathioprine) was initiated, given the persistence of clinical signs.

According to numerous studies, immunosuppressive treatment is used to reduce pathogenic antibodies [15].

1) The evolution under this treatment was favorable in our patient during his

hospitalization. Our patient did not benefit from plasmapheresis sessions due to the unavailability in our country, but he underwent a thymectomy during a medical evacuation with a favorable clinical evolution. Some authors have found that the addition of immunosuppressant is essential in order to prevent the rapid rise of anti-RACH Ac, others, on the other hand, suggest that plasma exchanges make lymphocytes more sensitive to the action of immunosuppressants [8]. Thus, there could be a synergy between plasma exchanges and immunosuppressants. It is described in the literature after 3 plasmapheresis sessions, the total body load of IgG is reduced by 70%, of IgM by 80% and it will take approximately 5 sessions to eliminate 95% of immunoglobulins [13]. Plasmapheresis has a very rapid action and allows the reduction of the sequestration of anti-RACH with a 12-day onset of action [12]. The benefit of thymectomy in the face of myasthenia gravis is proven in the literature. Indeed, thymoma is often associated with 10 to 15% of myasthenia gravis [8]. And there is a positive association in most studies, which is observed in our patient.

2) Additional examinations

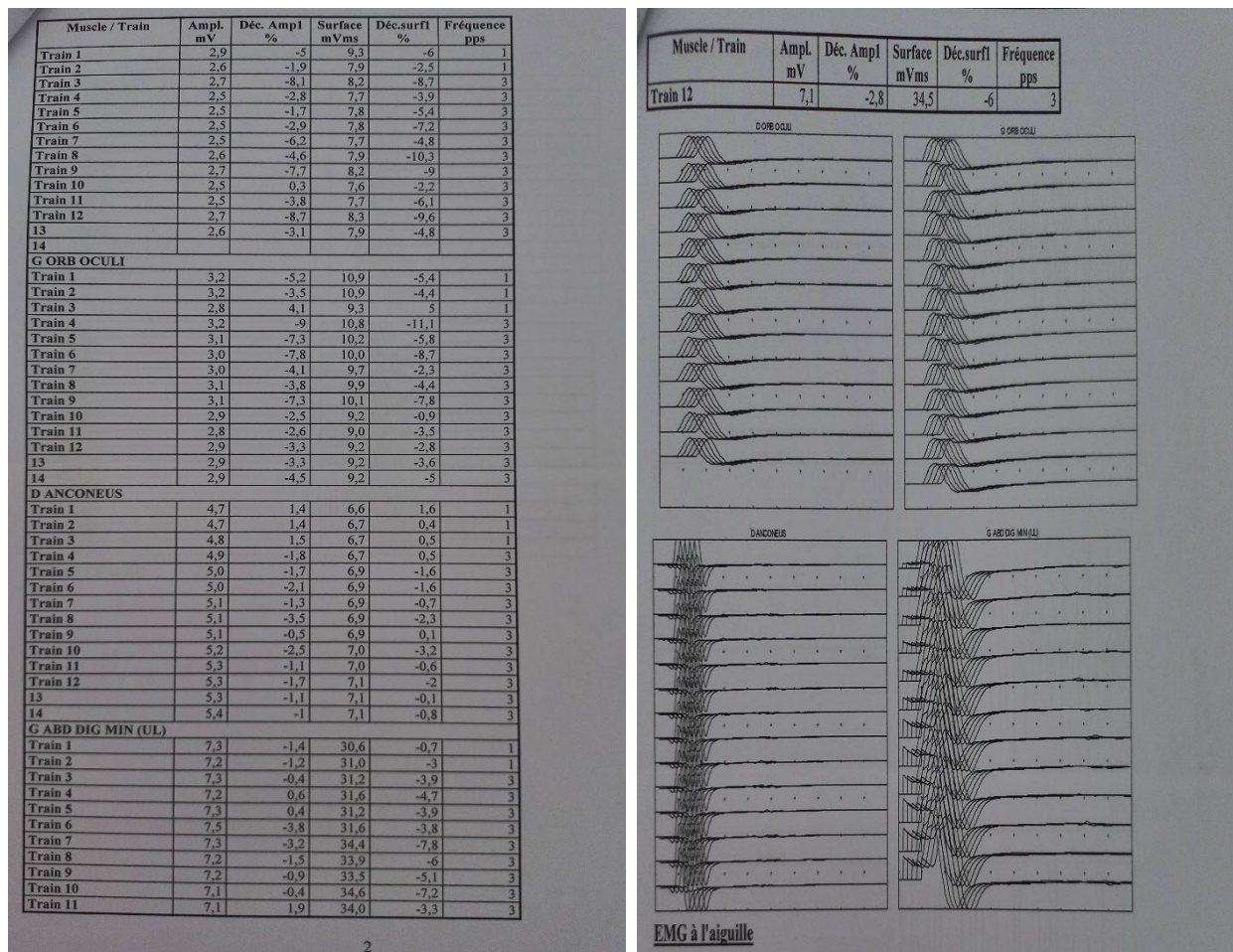


Figure 1. ENMG median nerve/abductor pollicis brevis, orbicularis oris and Ancona: repetitive stimulation at 3 Hz decreases in potential amplitude less than 5% (decrement).

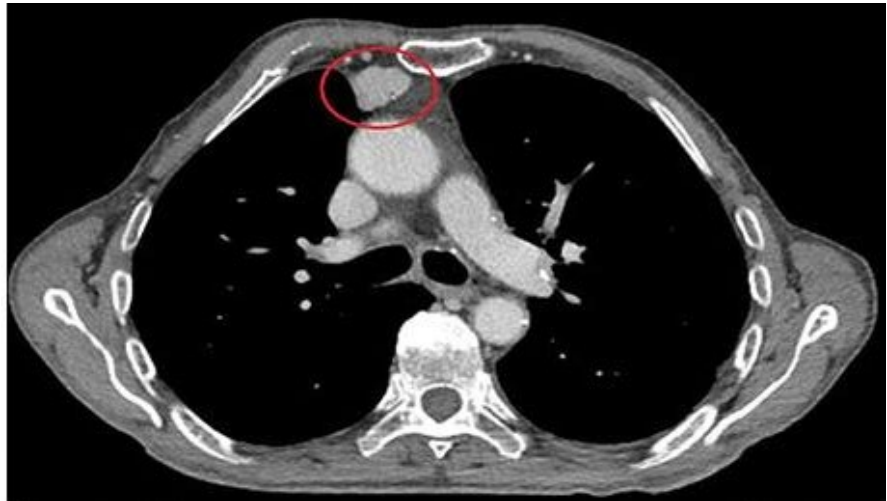


Figure 2. Chest CT scan showing a thymoma.

4. Conclusion

Myasthenia gravis, which is the most common autoimmune disease of the neuromuscular junction. It is rare in Sub-Saharan Africa in the literature; it should not be overlooked because of the life-threatening risk caused by damage to the respiratory and swallowing muscles and resulting in an impact on daily life with muscular fatigue during exercise. Paraclinical diagnosis in Sub-Saharan Africa still poses accessibility problems due to the lack of adequate technical facilities, requiring the use of medical evacuations. Specialization in neuromuscular diseases would help in the diagnosis and management of this condition.

Conflicts of Interest

The authors declare no conflicts of interest.

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