Published in final edited form as:

J Emerg Med. 2015 July ; 49(1): e23–e25. doi:10.1016/j.jemermed.2015.01.002.

Myasthenia Gravis Presenting as Persistent Unilateral Ptosis with Facial Droop

Sean K. Golden, BA^a, Chris J. Reiff, MD^a, Chris J. Painter, MD, MS^a, and Michael D. Repplinger, MD, MS^a

^aUniversity of Wisconsin School of Medicine and Public Health, Department of Emergency Medicine, F2/212 Clinical Sciences Center, 600 Highland Ave., Madison, WI 53792-3280, USA

Abstract

Background—Myasthenia gravis (MG) is an autoimmune neuromuscular disorder that is classically characterized by fluctuating weakness and fatigability of the ocular, bulbar, limb, or respiratory muscles. Over half of patients with MG will initially experience isolated ocular symptoms in one or both eyes. Most patients report that ocular symptoms are mild or undetectable upon awakening, and worsen throughout the day or with tasks such as driving. We describe an unusual case of MG presenting with an acute onset of persistent unilateral ptosis and ipsilateral facial droop without diurnal variation or other fluctuation in severity.

Case Report—A 58-year-old male presented to the Emergency Department with a three day history of persistent, unilateral ptosis with facial droop, concerning for stroke. However, head MRI found no evidence of stroke or any other central etiology. Routine laboratory testing was unremarkable. Neurology was consulted and they recommended sending acetylcholine receptor antibody tests. At the patient's subsequent neurology clinic visit, these tests were found to be abnormal. Electromyography was also done at this visit, confirming the diagnosis of MG. The patient subsequently underwent thymectomy and immunosuppressive therapy, with great improvement in his symptoms.

Why should an emergency physician be aware of this?—MG may present as unilateral ptosis or facial drooping without the hallmark characteristic of fluctuating muscle weakness. Early diagnosis and subsequent treatment of MG improves long term prognosis and remission rates. Emergency physicians should consider myasthenia gravis in cases of unilateral ocular symptoms after ruling-out emergent central etiologies.

© 2015 Elsevier Inc. All rights reserved.

Corresponding Author Address: Michael Repplinger, MD, MS, F2/212 Clinical Sciences Center, 600 Highland Ave., Madison, WI 53792-3280, mdreppli@medicine.wisc.edu, 608-890-5963 (W), 608-217-2963 (M).

Publisher's Disclaimer: This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Disclosures: No conflicts of interest

IRB approval: No approval sought given this is a case report (not required at our institution if less than 4 patients described).

Keywords

Myasthenia gravis; ptosis; facial weakness; stroke

Introduction

Myasthenia gravis is the most common disorder of neuromuscular transmission with an estimated prevalence of 20 cases per 100,000 people.¹ It is characterized by an antibody-mediated attack of proteins in the post-synaptic membrane, which results in a deficiency in signal transmission at the neuromuscular junction.² The hallmark of MG is a fluctuating degree of weakness of the ocular, bulbar, limb, or respiratory muscles that often worsens throughout the day or after prolonged muscle usage. Ocular weakness is by far the most common complaint, presenting in over half of patients.^{1–3} This often precedes more generalized symptoms, though symptoms may be isolated to a specific muscle group and can mimic other neurological disorders.^{4–8}

Unusual presentations of MG have been reported. Examples include unilateral abducens nerve palsy with diplopia and ataxia, isolated vocal cord paralysis with subsequent stridor, isolated dysphagia, and isolated respiratory failure.^{4–7} Patients with MG have also exhibited esotropia with diplopia.⁸ In a pediatric patient, MG presented as cyanosis and stridor, mimicking a foreign body aspiration.⁹ In this report, we describe a case of MG that presented as acute onset of persistent, unilateral ptosis with ipsilateral facial drooping – drawing concern for ischemic stroke – highlighting another one of the varied clinical manifestations of this disorder.

Case Report

A 58-year-old man presented to the ED with a chief complaint of right-eyelid weakness and slight right-sided facial droop. He reported first noticing his condition when he woke up three days prior, and that his symptoms had not changed since then. His past medical history was notable for hyperlipidemia and obesity, but absent of any personal or family history of similar symptoms or neurologic disorders. The patient denied headache, numbness, weakness, diplopia, or difficulty with speech, and had not experienced recent illness, injury, or changes in medication. Upon examination, the patient exhibited unilateral ptosis with subtle ipsilateral facial droop and weakness with raising his right eyebrow. The remainder of his neurologic examination, including motor, sensory, and coordination testing, was otherwise normal.

The differential diagnosis initially included stroke, cranial nerve palsy, Horner's syndrome, metabolic abnormality, or neuromuscular disorder. While in the ED, the patient was evaluated by the neurology service and underwent a head MRI that was interpreted as normal. Routine laboratory tests, including complete blood count, basic metabolic profile, and troponin measurements, were normal. Per consultant recommendations, acetylcholine receptor antibody tests (modulating, binding, and blocking antibodies) were ordered and the patient was advised to be seen in neurology clinic for follow up. The patient's antibody tests

returned positive, and the diagnosis of MG was confirmed by electromyography at his subsequent neurology visit.

No treatments were started at his emergency department visit; however, after the acetylcholine receptor antibody tests and subsequent electromyography results were received, the patient was informed of his prognosis and treatment options. He has since undergone thymectomy followed by immunosuppressive therapy comprised of prednisone and azathioprine. His symptoms have markedly improved.

Discussion

Myasthenia gravis is often called “the great imitator” for its ability to mimic a wide range of neurological disorders. One report of two cases of MG documented the overlap of symptoms with vertebrobasilar stroke, initially leading to misdiagnoses.¹⁰ Similarly, the case presented in this report highlights how MG may mimic stroke. Knowing this possibility becomes particularly critical when deciding whether to administer tPA for presumed ischemic stroke.

When presented with a patient exhibiting ptosis or facial droop, emergency physicians should consider myasthenia gravis even if symptoms do not appear to fluctuate in severity. The edrophonium (Tensilon) and ice pack tests are quick and easy bedside diagnostics with sensitivities and specificities exceeding 90% for ocular MG, though are less sensitive for generalized MG.^{11,12} Edrophonium chloride is an acetylcholinesterase inhibitor delivered intravenously that temporarily relieves muscle weakness in most MG patients by prolonging the presence of acetylcholine in the neuromuscular junction.^{13,14} Edrophonium has a rapid onset and short duration, and in patients with obvious ptosis or ophthalmoparesis, improvement is easily observed. However, edrophonium should be avoided in the elderly and in patients with a history of dysrhythmia, heart disease, or asthma, since edrophonium may induce symptomatic bradycardia and bronchospasm. Alternatively, the ice pack test can be used in patients with ptosis, but is not helpful for those with purely extraocular symptoms. A bag of ice is applied to the affected eyelid for approximately two minutes, after which the extent of ptosis is immediately assessed. Since neuromuscular transmission generally improves at lower temperatures, most MG patients with ptosis will show temporary improvement with cooling. The ice pack test is a safe, non-invasive test for MG, but should not be used for final diagnosis. Serological testing for autoantibodies against the acetylcholine receptor, if available, could be sent from the ED for suspected cases of MG. Additional testing, including repetitive nerve stimulation, single-fiber electromyography, and assays for muscle specific tyrosine kinase antibodies, can be performed in appropriate patients at the time of neurology follow-up to confirm the diagnosis.

Studies to rule-out other pathologies should also be performed in selected patients. For patients with ocular symptoms, an MRI of the brain may be appropriate. Since autoimmune thyroid disease is quite common in patients with MG (5.7–17.5%), blood tests could include a thyroid-stimulating hormone level to evaluate for thyroid ophthalmopathy.^{15,16} A CT or ultrasound of the orbits could also be considered. Lumbar puncture may be necessary to evaluate for lymphomatous or carcinomatous meningitis. Finally, once the diagnosis of MG

has been established, a CT or MRI of the chest is needed to evaluate for an associated thymoma.

Multiple treatments for MG are available, including acetylcholinesterase inhibitors, immunosuppressants, surgical thymectomy, and symptomatic therapy.¹⁷ For acute crises, immunoglobulin and plasma exchange have been shown to provide remarkable benefit. Treatment with moderate or high dose systemic glucocorticoids produces remission in approximately 30% of patients, and marked improvement in another 50%.^{18,19} Oral prednisone is the recommended initial glucocorticoid treatment, with improvements typically seen within two to three weeks of beginning therapy.²⁰ In most cases, high-dose glucocorticoids are started in hospitalized patients receiving concurrent plasmapheresis or IVIG for myasthenic crisis, since up to 50% of patients develop a transient deterioration, and 10% experience respiratory failure requiring mechanical ventilation.^{10,19} Alternatively, in patients without rapidly progressive symptoms or severe bulbar or respiratory weakness, glucocorticoid dose can be gradually increased in an outpatient setting.²¹ Without treatment, MG confers a poor prognosis with an associated mortality rate of approximately 75%, though this drops dramatically to less than 5% if treatment is initiated.²² In a retrospective analysis of over 840 patients with MG, the chance of complete remission was found to be correlated with shorter disease duration at the time of diagnosis as well as younger age at onset of MG and lower severity of symptoms at onset.²³ These results highlight the importance of early detection.

Why Should an Emergency Physician Be Aware of This?

Though classically characterized by fluctuating muscle weakness, myasthenia gravis may present as a persistent, focal weakness that mimics stroke or other central etiologies. Once central causes have been ruled out, emergency physicians should consider the possibility of MG in patients with persistent neurologic deficits. This is particularly important since early detection confers higher remission rates.

Acknowledgements

The project described was supported by the Clinical and Translational Science Award (CTSA) program, through the NIH National Center for Advancing Translational Sciences (NCATS), grant UL1TR000427. The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH.

References

1. Grob D, Brunner N, Namba T, Pagala M. Lifetime course of myasthenia gravis. *Muscle Nerve*. 2008; 37(2):141–149. [PubMed: 18059039]
2. Grob D, Arsura EL, Brunner NG, Namba T. The course of myasthenia gravis and therapies affecting outcome. *Ann N Y Acad Sci*. 1987; 505:472–499. [PubMed: 3318620]
3. Oosterhuis HJ. The natural course of myasthenia gravis: a long term follow up study. *J Neurol Neurosurg Psychiatry*. 1989; 52(10):1121–1127. [PubMed: 2795037]
4. Feuer H, Jagoda A. Myasthenia gravis presenting as a unilateral abducens nerve palsy. *Am J Emerg Med*. 2001; 19(5):410–412. [PubMed: 11555800]
5. Cridge PB, Allegra J, Gerhard H. Myasthenic crisis presenting as isolated vocal cord paralysis. *Am J Emerg Med*. 2000; 18(2):232–233. [PubMed: 10750943]

6. Brostoff JM, Dahdaleh D, Birns J. A cause of reversible dysphagia: an unusual presentation of myasthenia gravis. *Eur J Intern Med.* 2008; 19(1):70. [PubMed: 18206608]
7. Kim WH, Kim JH, Kim EK, et al. Myasthenia gravis presenting as isolated respiratory failure: a case report. *Korean J Intern Med.* 2010; 25(1):101–104. [PubMed: 20195411]
8. Colavito J, Cooper J, Ciuffreda KJ. Non-ptotic ocular myasthenia gravis: a common presentation of an uncommon disease. *Optom St Louis Mo.* 2005; 76(7):363–375.
9. Winter PH, Koopmann CF. Juvenile myasthenia gravis: an unusual presentation. *Int J Pediatr Otorhinolaryngol.* 1990; 19(3):273–276. [PubMed: 2210954]
10. Miller RG, Milner-Brown HS, Mirka A. Prednisone-induced worsening of neuromuscular function in myasthenia gravis. *Neurology.* 1986; 36(5):729–732. [PubMed: 3703276]
11. Pascuzzi RM. The edrophonium test. *Semin Neurol.* 2003; 23(1):83–88. [PubMed: 12870109]
12. Benatar M. A systematic review of diagnostic studies in myasthenia gravis. *Neuromuscul Disord NMD.* 2006; 16(7):459–467.
13. Daroff RB. The office Tensilon test for ocular myasthenia gravis. *Arch Neurol.* 1986; 43(8):843–844. [PubMed: 3729767]
14. Meriggioli MN, Sanders DB. Myasthenia gravis: diagnosis. *Semin Neurol.* 2004; 24(1):31–39. [PubMed: 15229790]
15. Ratanakorn D, Vejajiva A. Long-term follow-up of myasthenia gravis patients with hyperthyroidism. *Acta Neurol Scand.* 2002; 106(2):93–98. [PubMed: 12100368]
16. Kiessling WR, Pflughaupt KW, Ricker K, Haubitz I, Mertens HG. Thyroid function and circulating antithyroid antibodies in myasthenia gravis. *Neurology.* 1981; 31(6):771–774. [PubMed: 6787459]
17. Gilhus NE, Owe JF, Hoff JM, Romi F, Skeie GO, Aarli JA. Myasthenia gravis: a review of available treatment approaches. *Autoimmune Dis.* 2011; 2011:847393. [PubMed: 22007295]
18. Mann JD, Johns TR, Campa JF. Long-term administration of corticosteroids in myasthenia gravis. *Neurology.* 1976; 26(8):729–740. [PubMed: 821005]
19. Pascuzzi RM, Coslett HB, Johns TR. Long-term corticosteroid treatment of myasthenia gravis: report of 116 patients. *Ann Neurol.* 1984; 15(3):291–298. [PubMed: 6721451]
20. Schneider-Gold C, Gajdos P, Toyka KV, Hohlfeld RR. Corticosteroids for myasthenia gravis. *Cochrane Database Syst Rev.* 2005; (2):CD002828. [PubMed: 15846640]
21. Seybold ME, Drachman DB. Gradually increasing doses of prednisone in myasthenia gravis. Reducing the hazards of treatment. *N Engl J Med.* 1974; 290(2):81–84. [PubMed: 4808454]
22. Alshekhlee A, Miles JD, Katirji B, Preston DC, Kaminski HJ. Incidence and mortality rates of myasthenia gravis and myasthenic crisis in US hospitals. *Neurology.* 2009; 72(18):1548–1554. [PubMed: 19414721]
23. Beghi E, Antozzi C, Batocchi AP, et al. Prognosis of myasthenia gravis: a multicenter follow-up study of 844 patients. *J Neurol Sci.* 1991; 106(2):213–220. [PubMed: 1802969]