Paediatric myasthenia: A moving target

Hanna Kolski MD FRCPC[1], Jiri Vajsar MD FRCPC[2], Danielle Grenier MD FRCPC[3]

A two-and-a-half-year-old boy presented to the emergency department with an upper respiratory tract infection and increasing breathing difficulties over the past 24 h. His health was normal until two months before presentation. Since then, his parents noticed progressive (although fluctuating) motor weakness, trouble chewing and swallowing as well as episodes of choking on his secretions. His speech deteriorated to monosyllables, and he had trouble walking and getting up off the floor. The boy's 'tiredness' seemed substantially more noticeable in the evenings.

A physical examination of the boy revealed moderate respiratory distress. Otherwise, the only remarkable physical signs included bilateral asymmetrical ptosis (his right eye appeared to be more affected than his left eye), and decreased facial movements with the inability to close his eyes and with his mouth hanging open. He was generally weak, hypotonic and could not rise from a lying position. His deep tendon reflexes were preserved.

On admission, his respiratory status deteriorated to the point of requiring intubation for five days. A diagnosis of respiratory syncytial virus pneumonia was confirmed. Although his respiratory status improved, his weakness remained. Diagnostic evaluations included high acetylcholinesterase antibodies and a positive edrophonium test, resulting in transient reversal of the ptosis.

During the next six months, the patient was treated with various combinations of pyridostigmine, intravenous immunoglobulin and corticosteroids, with only partial improvement. At three years of age, he underwent a thymectomy. Within one year, he was weaned off all medications (pyridostigmine and prednisone). Four years later, he remains in complete remission.

LEARNING POINTS

- Juvenile myasthenia gravis (JMG) is a rare autoimmune-mediated disorder acquired in childhood, representing 10% to 15% of all cases of myasthenia gravis. It is generally characterized by muscle weakness secondary to antibodies that bind acetylcholine receptors at the neuromuscular junction, preventing transmission of the nerve impulse to the muscle.
- The majority of patients with JMG present with fluctuating ocular symptoms, such as ptosis, diplopia and strabismus. Many patients with JMG will develop variable fatigability, proximal limb weakness and bulbar problems, such as altered chewing and swallowing, drooling, nasal or weak voice, and poor pronunciation. If the condition is left untreated, there is a risk of respiratory muscle paralysis leading to respiratory failure and death.
- A high index of suspicion is required because ptosis and diplopia may only become apparent with sustained upgaze for 2 min. Similarly, weakness of deltoids and hips may be elicited only after strength has been repeatedly tested.
- Diagnostic tests include edrophonium administration, nerve conduction studies (with repetitive stimulation) and antibody titres against acetylcholine receptors at the neuromuscular junction. A significant percentage of patients are seronegative for the acetylcholine receptor antibodies, particularly prepubertal children and those with exclusively ocular presentations.
- JMG is generally a treatable disease. Symptomatic patients are initially treated with an acetylcholinesterase inhibitor that increases acetylcholine levels at synaptic junctions. If symptoms persist, immunomodulatory drugs are added, typically prednisone followed by other immunosuppressants. Intravenous immunoglobulin or plasmapheresis can be used for severe breakthrough symptoms. If significant bulbar or limb weakness persists despite a reasonable medication trial, a thymectomy is often recommended.
- To determine the national incidence of JMG, a Canadian Paediatric Surveillance Program study was initiated in January 2010. The study is also designed to increase awareness, document the burden of illness and inform on best treatment practices.
- Early recognition and management of JMG helps to avoid unnecessary testing, prevents the progression of symptoms, and results in low morbidity and mortality.

RECOMMENDED READINGS

1. Gadient P, Bolton J, Puri V. Juvenile myasthenia gravis: Three case reports and a literature review. J Child Neurol 2009;24:584-90.
2. Chiang LM, Darras BT, Kang PB. Juvenile myasthenia gravis. Muscle Nerve 2009;39:423-31.

The Canadian Paediatric Surveillance Program (CPSP) is a joint project of the Canadian Paediatric Society and the Public Health Agency of Canada, which undertakes the surveillance of rare diseases and conditions in children and youth. For more information, visit our Web site at <www.cps.ca/cpsp>.

[1]*Stollery Children's Hospital, University of Alberta, Edmonton, Alberta;* [2]*The Hospital for Sick Children, Toronto;* [3]*Canadian Paediatric Society, Ottawa, Ontario*

Correspondence: Canadian Paediatric Surveillance Program, 2305 St Laurent Boulevard, Ottawa, Ontario K1G 4J8. Telephone 613-526-9397 ext 239, fax 613-526-3332, e-mail cpsp@cps.ca

Accepted for publication February 19, 2010

