Ataxic Form of Guillain-Barré Syndrome:
Differential Diagnosis of Acute Cerebellar Ataxia

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Abstract
A 52-year-old man experienced fever, sore throat, and rhinorrhea for several days. Some days after resolution he developed dizziness, paresthesia on the hands, and unsteady gait. Ocular movement was not limited. His gait was ataxic and no limb weakness on Romberg sign was evident. Muscle stretch reflexes were absent. Acute cerebellar ataxia was suspected. Anti-GQ1b antibody, however, was detected in his serum during the acute phase of the illness. Ataxic form of Guillain-Barré syndrome was diagnosed. Ataxic Guillain-Barré syndrome is one of the differential diagnoses for acute cerebellar ataxia.

Key Words
cerebellar ataxia, anti-GQ1b antibody, ganglioside, Guillain-Barré syndrome, Miller Fisher syndrome

Introduction
Acute cerebellar ataxia, Miller-Fisher syndrome (MFS) and the ataxic form Guillain-Barré syndrome (GBS) all present with symptoms of cerebellar ataxia after flu-like illness. The ataxic form of GBS without ophthalmoplegia or a loss of proprioceptive sense is rarely reported. We present herein a rare case of the ataxic form of GBS without ophthalmoplegia after a flu-like illness. Initially we suspected a diagnosis of acute cerebellar ataxia, but serum anti-GQ1b IgG antibodies were detected during serological examinations. Here we describe how we confirmed the differential diagnosis of the ataxic form of GBS and discuss the relevance to clinical practice.

Case Report
A 52-year-old man developed a flu-like illness (low grade fever, sore throat, and rhinorrhea) 10 days prior to the onset of neurologic symptoms. The day before admission, he developed remarkable gait unsteadiness that prohibited walking and had sensations of floating, dizziness, and tingling in his hands. He did not experience double vision. His medical history was unremarkable except for having right peripheral facial palsy at 22 years of age. He consulted a physician at our hospital in late May 1999 for sensations of floating. He was treated for 7 days with peroral prednisolone (30 mg/day) but admitted 9 days later because of increased difficulty in walking.

Upon admission, he had no fever and a general physical examination was normal. He was alert and his mental state and higher brain function were normal. The pupils were isocoric having a round shape. The light reflex was prompt and the convergence reflex was normal. External ocular movements were unaffected. Examination revealed a horizontal gaze-evoked nystagmus. The other cranial nerves were normal. He had no motor paralysis in the limbs and his sensory system was normal. Romberg sign was negative. Ataxic gait was recognized. The finger-to-nose test and finger-to-finger...
tests revealed slightly reduced coordination and the heal-to-knee test was poor bilaterally. He had upper and lower limb incoordination and dysmetria. Tendon reflexes were decreased in the arms and were absent in the lower limbs. No pathological reflex was noted. He had no sphincter disturbance or dysautonomic function.

Routine urinalysis, blood biochemistry, and hematology were normal upon admission. The cerebrospinal fluid examination revealed a normal cell count of 6/mm³ but an increased protein level of 127 mg/dl. Anti-ganglioside antibody levels showed IgG antibody titers to GQ1b and GT1a were abnormally elevated (1:4,000 and 1:1,000, respectively). No antibodies were detected against GM1, GM2, GD1a, GD1b or GT1b. No abnormalities were detected in the serum of various virus antibody titers. The bacilli that would indicate a specific diagnosis, such as Campylobacter jejuni, were not detected in the pharynx or feces. Electrophysiologically examination revealed normal motor and sensory conduction velocities in the median, ulnar, posterior tibial, and deep peroneal nerves. F wave latencies, however, stimulated on the popliteal fossa were remarkably delayed to 42.5–42.7 msec in the posterior tibial and deep peroneal nerves. A brain CT scans and MRI showed no abnormalities in any areas.

On the day of admission, the dose of prednisolone was increased to 60 mg/day. On the 13th hospital day, the horizontal gaze-evoked nystagmus disappeared, followed by the disappearance of ataxic gait 2 days later. He was discharged on the 42nd hospital day. On the hospital 76th day, numbness disappeared. The titers of serum anti-GQ1b IgG antibody and anti-GT1a IgG antibody were both 1:250 on the 137th day after the admission day. He has experienced no recurrent ataxia since then.

Discussion

A diagnosis of acute cerebellar ataxia was originally suspected in the present case because of the symptoms of remarkably acute ataxic gait and nystagmus after flu-like illness. Acute cerebellar ataxia, however, does not manifest numbness in the hands. Richer⁷ proposed an ataxic variant of GBS for patients presenting with acute cerebellar ataxia without external ocular movements or loss of proprioceptive sense. The present case was regarded as a rare case of the ataxic form of GBS. In addition, MFS secondary to ataxic GBS was diagnosed from the increased protein level in the cerebrospinal fluid and serum anti-GQ1b IgG antibody. However, the patient presented with an unusual type of MFS because he did not show progressive ocular movement dysfunction. During a literature search we found only one case similar to the one presented here. This case was reported by Mori et al.⁷ described a 35-year-old male patient presenting with ataxic gait and positive serum anti-GQ1b and anti-GT1a IgG antibodies, without motor paralysis in the limbs or ophthalmplegia. Particular importance was attached to the finding of positive serum anti-GQ1b IgG antibodies by Mori et al. and they proposed that acute cerebellar ataxia without ophthalmplegia is one clinical feature of anti-GQ1b IgG antibody syndrome.

In addition, Kusunoki et al.⁷ described 5 patients who had anti-GQ1b IgG antibodies and ataxia without profound weakness in the limbs⁶. In terms of acute ataxia without ophthalmplegia, reports of the ataxic form of GBS in addition to the above are rare⁴. In this ataxic form of GBS, patients present with remarkable cerebellar ataxia which is unaccompanied by external ocular paralysis or proprioceptive loss at the onset of GBS and thus, it is considered to be a variant of GBS.

On the other hand, MFS manifests typical symptoms of ocular movement dysfunction, ataxic gait, and areflexia clinically⁵, and often reveals positive serum anti-GQ1b IgG antibody⁵. Willison et al.⁶ reported one patient as having incomplete MFS from acute ataxic neuropathy and positive serum anti-GD1b and anti-GD3 antibodies. MFS, Bickerstaff’s brainstem encephalitis, and GBS concomitant with ocular palsy generally show positive serum anti-GQ1b antibody. This antibody is localized in the paranodes of the human oculomotor nerve, trochlear nerve and abducent nerve.⁵ The anti-GT1a antibody induces cross-reaction for the anti-GQ1b antibody in MFS⁵, but the mechanism remains unclear.

One report describes a case of acute oropharyngeal palsy associated with the anti-GT1a antibody⁶. It is unclear why the present patient had positive serum anti-GQ1b and anti-GT1a antibodies despite having no ocular or pharyngeal palsy. When we compare the present case with that of Mori et al.⁷, however, a change in the gangliosides of the cerebellum or sensory nerve is suggested by the presence of acute ataxia and dysesthesia. Generally acute cerebellar ataxia is a disease that affects infants, but
onset in adulthood has been reported in recent years. Epstein-Barr virus or other viral infections have been reported to cause acute cerebellar ataxia in adults, but viral infection was not confirmed in the present case.

When we consider our case and that of Mori et al., we postulate that there may be some association or common pathological mechanism between MFS and acute cerebellar ataxia, which are considered to be different diseases currently. Moreover, we believe that the existence of the anti-ganglioside antibody is one of the important associations, since symptoms of acute cerebellar ataxia suggest that an unknown ganglioside antibody may be present. In addition, Yuki et al. have reported that MFS and the ataxic form of GBS form a continuous spectrum clinically and serologically. The present case is regarded as a rare example of the ataxic form of GBS.

Given our findings in the present case, we suggest that clinicians be cognizant of the ataxic form of GBS and incomplete MFS when differentially diagnosing acute cerebellar ataxia. Further research should determine the role of anti-ganglioside antibodies in these diseases.

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References

Guillain-Barré 症候群失調型と考えられた 1 例：
急性小脳性運動失調症との鑑別

大島 淳 
矢崎 俊二

抄録

症例は 52 歳男性。数日間続く発熱、咽頭痛後、めまい感、手指の異常感覚と不安定歩行が出現、次第に悪化し当科入院。眼球運動に制限なし。歩行は失調性だったが脱力。Romberg 徴候を認めず、急性小脳失調が疑われたが、臨床症状および各種検査を含め急性期の血清抗 GQ1b 抗体陽性より Guillain-Barré 症候群失調型と診断した。Guillain-Barré 症候群失調型は急性小脳性運動失調症と鑑別を要する疾患の 1 つと考えられ、若干の考察を加え報告する。