

# Myoclonic seizures in a young girl with Fisher's variant of Guillain-Barré syndrome

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### ABSTRACT

A 10-year-old girl with Fischer's variant of acute Guillain-Barré syndrome is described. She had predominantly sensory involvement with autonomic dysfunction, ophthalmoplegia and myoclonic jerks. Myoclonus persisted for 2 weeks and the pupillary involvement was evident even after 2 months. The association of myoclonus with Guillain-Barré syndrome has not been previously reported.

**Keywords:** Guillain-Barré syndrome, Fisher's variant, myoclonus, autonomic dysfunction.

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Miller Fisher Syndrome (MFS), a variant of Guillain-Barré Syndrome (GBS) is characterized by ophthalmoplegia, ataxia and areflexia.<sup>1</sup> A few cases of GBS with myokymia<sup>2</sup> and opsoclonus<sup>3</sup> have also been described. Recently, bilateral ballism was reported in a patient with overlapping MFS and GBS.<sup>4</sup> We describe an Omani girl with MFS who exhibited myoclonic jerks and autonomic dysfunction.

**Case Report.** A 10-year-old Omani girl, presented to the local hospital with low-grade fever, cough and sore throat, and was started on systemic antibiotics. Two days later, she developed narrowing of the left palpebral fissure, double vision and swallowing difficulty. She was noted to have ptosis of the left eye, bilateral restriction of eye movements, dysphagia and dysphonia with absent gag reflex. The optic fundus examination was normal on both sides. She also had mild asymmetric weakness of the

extremities (power grade 4/5 Medical Research Council) with areflexia. The plantars were down going. The patient was conscious and had no bowel or bladder dysfunction. Her blood counts, electrolytes, creatine kinase, computerized tomography (CT) scan of the brain and chest x-ray were normal. Cerebrospinal fluid (CSF) analysis showed 4 cells/cmm (P<sub>15</sub>, L<sub>85</sub>), with normal glucose and protein. Gram stain of the CSF was negative. She was suspected to have GBS and commenced on intravenous immunoglobulin (IVIG) 400 mg/kg/day. As her neurologic status continued to deteriorate, she was sedated, with midazolam, electively intubated and ventilated, and transferred to our hospital. Re-evaluation (after weaning off from midazolam) showed a conscious girl responding to commands by hand movements. She had complete ophthalmoplegia, with dilated and non-reacting pupils. She had pooling of secretions in the throat and could not move the head from side to side. The respiratory movements were weak and the chest

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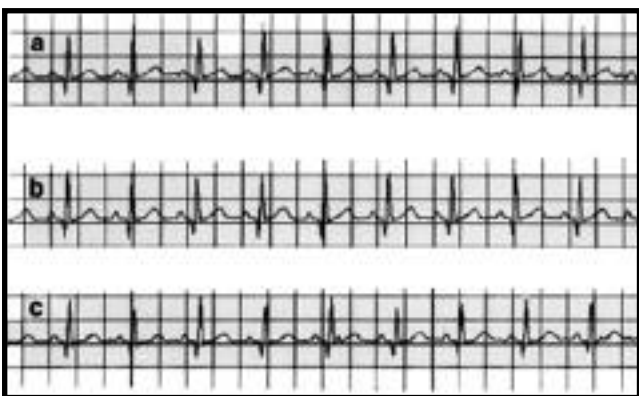
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expansion was only 0.5 cm. The power in the extremities was 3/5 distally and 1/5 proximally. All deep tendon jerks were absent and the plantars down going. Her pulse rate was 130/min and regular, but did not exhibit any fluctuation with painful stimuli. She was also hypertensive with a blood pressure (BP) of 148/98 mm Hg (>95th centile for age). Nerve conduction studies revealed normal motor conduction. The compound muscle action potential was reduced to 1.5-2 mv in upper and lower limbs. No F waves were demonstrated and no sensory nerve could be stimulated. Blink reflex was absent and direct facial latency was not recorded. Brainstem auditory evoked potentials (BAEP) were normal on both sides. Repeat chest radiograph revealed presence of pneumonia in the right base. Investigations for porphyria and systemic lupus erythematosus (SLE) were negative also the antiphospholipid antibodies and serology for poliovirus, mycoplasma, brucella and borrelia. We did not look for *Campylobacter jejuni* and serum immunoglobulin G (IgG) anti-ganglioside Q1b (GQ1b) antibody titre could not be measured. Serum electrolytes revealed low sodium (128 meq/L), which persisted for approximately one week. Twelve-lead electrocardiogram (ECG) showed sinus tachycardia and echocardiography did not show any evidence of myocarditis. Twenty-four-hour ambulatory ECG was notable in that there was no change in the heart rate with pain or activity (**Figure 1**), neither was there any diurnal variation in the heart rate. Ventilatory support was continued and midazolam infusion restarted. She also had the full course of IVIG infusion for 5 days (total dose 2 g/kg). Supportive therapy in the form of nasogastric feeding, oral sodium chloride supplements for the hyponatremia, and systemic antibiotics for pneumonia were commenced. Serum sodium was normal on the 5th day of hospitalization. On the 8th day, sudden brief symmetrical abnormal myoclonic jerks in upper and lower limbs were noted

distally, with frequency of 15-20/minute. There were no associated movements in eyes, head, neck or trunk.

Electroencephalogram revealed bihemispherical theta background with superimposed fast beta (possibly due to midazolam) activity. There were no seizure discharges. The abnormal jerks in the extremities lasted for approximately 2 weeks and responded to increments of midazolam infusion. No surface of electromyography (EMG) or simultaneous EMG/EEG were recorded. We could communicate with her through her hand movements in response to commands. The CSF was repeated on the 17th day of illness, and showed 4g protein/L and 14 white blood cells/cmm (all lymphocytes). There were no red blood cells and sugar was 3.8 mmol/L (normal). A repeat dose of IVIG was given 2 weeks after the initial course of 5 days. On day 10 of illness, there was some opening of the left eye, on the 32nd day some eye movements to the left were noted and the pupils, which remained dilated until day 20 of illness, started reacting to light. The side-to-side head movements returned on day 20. On day 36, both eyes could be opened fully, although closure was weak. The left gaze was 4 mm, right gaze 3 mm, up gaze one to 2 mm and down gaze 2-3 mm. On day 42 there were full eye movements with opening, but eye closure was still weak and there was pooling of secretions in the throat. She was extubated on day 50. The girl was discharged after 70 days of hospitalization with full eye movements, though closure was weak and the pupillary reaction remained sluggish. The throat secretions were less. She could just sit with support. Her BP was under control and atenolol therapy was discontinued after 2 months. On subsequent follow-up, she was found to have normal power of both hands and feet, and was back to school, doing well in her routine activities.

**Discussion.** Our patient had a variant of GBS known as MFS, with ophthalmoplegia, areflexia, sensory loss with features of autonomic system disturbances (hypertension, tachycardia), syndrome of inappropriate antidiuretic hormone secretion (SIADH), and myoclonic seizures. Several unusual clinical features in otherwise typical cases of GBS have been described,<sup>1</sup> including reports of facial myokymia, muscle fasciculations and impaired consciousness. Facial or limb myokymia were seen in 17% of 48 consecutive patients of GBS.<sup>2</sup> These occurred early in the course of illness, were bilateral and persisted for 5-40 days, as the patients recovered. Opsoclonus and bilateral ballism have also been described in a patient with GBS.<sup>3,4</sup> One patient with unexplained convulsion, normal EEG and normal CT scan of the brain has been described in the Massachusetts General Hospital retrospective series. Dystonia has been reported in 2 patients and action myoclonus in one.<sup>5</sup> Despite an extensive Medline



**Figure 1-** Tracings from the 24-hour ambulatory electrocardiogram showing constant heart rate (a) while awake, (b) during sleep and (c) during painful stimulus.

search, we could not find any reported association of GBS and myoclonus. In our patient, the myoclonus was self limited and lasted for approximately 2 weeks. The movements were more pronounced in distal extremities, and associated eye movements could not be observed possibly due to the pronounced proximal muscle weakness and complete ophthalmoplegia. She required an increase in the dose of midazolam infusion to control the myoclonic movements. Her EEG and CT scan of the brain were normal. The magnetic resonance imaging (MRI) facility was not available. The exact mechanism of myoclonus in this situation remains unclear. Brainstem origin remains likely as suggested by the symmetrical distribution although the rate was not very fast. Similar myoclonic jerks have been reported with lesions of central tegmental tract or dentate-olivary pathway, which produce denervation hypersensitivity of the contralateral olivary nucleus.<sup>6</sup> Yuki et al<sup>7</sup> have postulated that MFS and Bickerstaff encephalitis represent a specific autoimmune disease that has wide range of symptoms that are clinically similar and demonstrate IgG anti-GQ1b antibody. Immunoglobulin G and anti-GQ1b antibody if positive would have helped the diagnosis, however, the facility was not available. Odaka et al<sup>4</sup> explained ballism in their patient of MFS variant of GBS on brainstem involvement. The clinical features, peripheral nerve involvement, CSF albumino-cytological dissociation and normal BAEP exclude Bickerstaff encephalitis in our patient. Myoclonus could be a manifestation of SIADH and severe hyponatremia,<sup>8</sup> but our patient had only borderline hyponatremia, and myoclonus was noted only after serum sodium returned to normal and continued for approximately 10 days thereafter. Mild hypertension cannot explain myoclonic jerks, though autonomic instability and hypertension resulting in subarachnoid hemorrhage in GBS has been reported to produce seizures.<sup>9</sup> Syndrome of inappropriate antidiuretic hormone secretion and hypertension are well documented in GBS. Pupillary abnormalities with severe ophthalmoplegia have also been described.<sup>1</sup> Antiphospholipid antibodies syndrome and SLE can manifest with features resembling GBS including seizures and myoclonus but do not fulfill the diagnostic criteria and investigations were negative in our patient.<sup>10,11</sup> Our patient had pneumonia soon after onset of GBS. This is not rare

in intubated patients. Mycoplasma pneumonia antibodies were negative. Mycoplasma pneumonia infection and neurological involvement, which could be central or peripheral, has also been reported.<sup>12,13</sup> An association of generalized tonic-clonic seizures and GBS in such an infection has also been described.<sup>13</sup> The association of SIADH, hypertension, Fisher's variant of GBS and myoclonus – all in one patient with severe form of GBS prompted us to report this.

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