Friedreich Ataxia: Clinical Feature and Electrophysiological Symptoms

Friedreich ataxia is inherited as an autosomal recessive disorder involving the spinocerebellar tracts, dorsal columns in the spinal cord, the pyramidal tracts, and the cerebellum and medulla. The majority of patients bear a recessive GAA triplet-repeat expansion on intron 1 of both alleles while a minority carry an expansion on allele and a point mutation or deletion on the other. The disease-causing genotype leads to decreased production of frataxin. Mutations cause oxidative injury associated with excessive iron deposits in mitochondria; frataxin deficiency leads to mitochondrial iron accumulation, deficient production of adenosine triphosphate, and a potential rise in free radical generation. These events lead to onset of a variety of symptoms, such as gait disturbance, loss of sensation, areflexia, and dyscoordination, beginning usually between ages 5 and 15 years although later onset is not uncommon.

Approximately two-thirds of individuals with Friedreich ataxia have cardiomyopathy and up to 30% have diabetes mellitus. The loss of frataxin function in mitochondria accounts for these pathogenic processes in Friedreich ataxia. Mitochondria are essential for the sensing of nutrients by the β cell and for the generation of signals that trigger and amplify insulin secretion, known as stimulus-secretion coupling. Moreover, in the intrinsic pathway of apoptosis, pro-apoptotic signals converge on mitochondria, resulting in mitochondrial Bax translocation, membrane permeabilization, cytochrome c release and caspase cleavage.

The ataxia is slowly progressive and involves the lower extremities to a greater degree than the upper extremities. In general, results of electrophysiologic studies including visual, auditory brainstem, and somatosensory-evoked potentials are often abnormal.

In the article “Diabetes Mellitus as the Presenting Feature of Friedreich Ataxia,” the authors report a case of an 8-year girl who initially presented with diabetic ketoacidosis and was treated as case of insulin dependent diabetes mellitus. Furthermore, they report an axonal type of generalized sensory neuropathy and lower MCV in tibial nerve. The authors assumed the diagnosis of Friedreich ataxia for the patient. However, neuroimaging and FXN gene analysis were not conducted. The co-morbidity of diabetes mellitus and peripheral neuropathy can also result from mitochondrial disorders, and could represent a complication of hereditary motor and sensory neuropathy in a diabetic patient by chance. In addition, atypical Friedreich ataxia due to compound heterozygosity for FXN GAA expansion and a point mutation may present a greater diagnostic dilemma.

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REFERENCES
Letters to the Editor

O). Follow‑up

A patient became somnolent, with inadequate verbal responses, and developed a series of generalized tonic‑clonic seizures, after which she was transferred to the intensive care unit. External ventricular drainage (EVD) was inserted preoperatively. Gross total tumor resection with facial nerve preservation was performed through a retrosigmoid craniotomy, using intraoperative evoked potential monitoring.

A medium‑sized (2.5 cm × 3 cm) tumor, characterized radiologically as schwannoma, was noted in the left cerebellopontine angle, without signs of fourth ventricle compression or aqueductal stenosis. Immediately before the planned surgery, the patient did not tolerate EVD weaning, requiring the placement of a ventriculoperitoneal CSF shunt with a programmable valve system.

Figure 2a‑c. The patient improved: Glasgow Coma Scale 15, House‑Brackmann grade II facioparesis, without headaches or other neurological symptoms. J Neurosci Rural Pract 2017;8 Suppl S1:117‑9.

Figure 2d. As her condition improved, she was transferred to a neurosurgical unit and subsequently dismissed from hospital neurologically improved: Glasgow Coma Scale 15, House‑Brackmann grade II facioparesis, without headaches or other neurological symptoms. J Neurosci Rural Pract 2017;8 Suppl S1:117‑9.

A. Influenza virus‑related hydrocephalus has been described in the literature. De Santis et al. reported a case of influenza‑related cerebellitis with secondary hydrocephalus, where the patient had developed focal neurological symptoms. J Child Neurol 2012;27:1133‑7.

To the best of our knowledge, there have been no previously reported cases of H3N2 type A influenza virus‑related hydrocephalus, and we describe here a case of H3N2 type A influenza virus‑related hydrocephalus.

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