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Subacute Sensorimotor Polyneuropathy Associated with Autoimmune Hepatitis

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Dear Editor,

Autoimmune hepatitis (AIH) is a chronic immune-mediated liver disorder with unknown etiology that is characterized by seropositivity for autoantibodies and responsiveness to immunosuppressive treatment.[1] AIH is frequently associated with other autoimmune diseases,[2] and there have been rare reports of associated peripheral neuropathies.

A 43-year-old woman was admitted to our hospital because of epigastric pain, abdominal distension, dark urine, and yellow sclera with a duration of 2 months. Laboratory studies revealed elevated liver enzymes and positivity for anti-smooth-muscle antibody and antinuclear antibodies. Liver biopsy findings were compatible with AIH. She was treated with oral methyl-prednisolone (40 mg daily), which normalized liver enzymes within 2 weeks.

The patient was referred to the neurology department because of combined sensory loss and weakness. Ascending-type sensory loss had started 1 month before admission. Two weeks later she complained of severe burning pain and paresthesia in both the feet and hands. The weakness in both legs had progressed since 4 days before admission. A neurologic examination revealed mild weakness of both legs [Medical Research Council (MRC) grade 4]; almost completely impaired touch, vibration, and proprioception sensations in both legs, without pain or temperature sensory involvement; generalized hypoactive deep tendon reflexes; and difficulty performing the heel-to-shin test. The initial nerve conduction study (NCS) revealed bilateral mild slowing of nerve conduction in the peroneal nerves, and an inability to elicit nerve action potentials in the sural nerves on both sides. Electromyography revealed cervical and lumbosacral radiculopathy with active denervation and reduced recruitment pattern; there was no evidence of myopathy. The patient was negative for the following ganglioside antibodies: anti-GM1, anti-GD1b, and anti GQ1b. The results of a cerebrospinal fluid study were normal.

Despite receiving corticosteroid treatment, the limb weakness progressed rapidly, so that on treatment day 10 the power in both legs was MRC grade 2, and that in both arms was MRC grade 4. The NCS results indicated progression of the polyneuropathy (Table 1). Intravenous immunoglobulin (IVIG) was administrated at a dose of 0.4 g/kg body weight/day for 5 days, which resulted in a dramatic improvement in the leg weakness to MRC grade 4+ after 3 days. Prednisolone maintenance therapy and rehabilitation resulted in the patient being able to stand with assistance 1 month later. Proprioception was also slightly improved, and the pain was diminished. The NCS profile and motor power were further improved 2 months later, but issues with vibration and proprioception persisted.

AIH-related peripheral neuropathy has been rarely reported among the various clinical manifestations, which include chronic inflammatory demyelinating polyneuropathy,[3] mononeuritis multiplex,[2] motor-axonal polyneuropathy,[4] and sensory neuronopathy.[5] Immunosuppressive agents have been reported to be effective in several patients. This implies that the peripheral neuropathy associated with AIH is mediated by the immune system. The temporal

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Table 1. Nerve conduction study

Nerve	Amplitude (mV)			DL (ms)			Velocity (m/s)			F wave (ms)		
	RT	LT	NL	RT	LT	NL	RT	LT	NL	RT	LT	NL
Motor conduction studies												
Median												
W	12.6		≥5	2.8		≤3.6				22.7		≤26.65
E	12.1		≥5				54		≥49.96			
Ax	11.5		≥5				57.8		≥55.96			
Ulnar												
W	7.5		≥5	2.3		≤2.51				22.8		≤26.62
BelE	6.8		≥5				55.8		≥50.61			
AbE	6.7		≥5				62.5		≥52.69			
Ax	6.6		≥5				66.6		≥58.22			
Tibial												
A	1.6	1.7	≥5	4.8	4.5	≤5.11				NR	NR	≤46.16
PF	0.8	1.2	≥5				39.5	40	≥40.63			
Peroneal (EDB)												
A	NR	NR	≥4	NR	NR	≤4.78				NR	NR	≤46.79
FH	NR	NR	≥4				NR	NR	≥41.85			
PF	NR	NR	≥4				NR	NR	≥39.11			
Sensory conduction studies												
Median												
F-W	NR		≥10				NR		≥41.26			
P-W	NR		≥10				NR		≥34.05			
W-E	NR		≥10				NR		≥49.39			
E-Ax	NR		≥10				NR		≥53.95			
Ulnar												
F-W	NR		≥10				NR		≥39.26			
W-E	19		≥10				48.7		≥47.46			
E-Ax	10		≥10				54.5		≥48.18			
Sural												
Calf	NR	NR	≥6				NR	NR	≥34.68			

A: ankle, AbE: above elbow, Ax: axilla, BelE: below elbow, DL: distal latency, E: elbow, EDB: extensor digitorum brevis, FH: fibular head, LT: left, NL: normal, NR: no response, PF: popliteal fossa, RT: right, W: wrist.

pattern of progression appears to reveal an interesting feature of AIH-associated polyneuropathy: the initial predominant involvement of the large sensory fibers, leading to sensory ataxia, with the defects in vibration and proprioception being followed by severe burning pain and then weakness, suggesting the increasing involvement of small fibers and motor nerve fibers. This pattern of progression led us to speculate that there is a gradient in susceptibility among different types of nerve fibers in the disease process.

Oral prednisolone alone was not effective in treating the polyneuropathy in our patient, but the weakness was dramatically improved by IVIG. IVIG works effectively in many autoimmune neuromuscular diseases by interfering with the immune regulatory network.[6] Therefore, IVIG would be an option for the rapidly progressing neuropathy associated with AIH.

AIH-related neuropathy is extremely rare, but it is important to identify this condition in AIH patients with neurologic signs because of its responsiveness to immunotherapy. Further studies with more cases are needed to clarify its pathomechanism and clinical characteristics.

Conflicts of Interest

The authors have no financial conflicts of interest.

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