Commentary

Guillain-Barré syndrome (GBS), an immune-mediated peripheral nerve disorder, is the most frequent cause of acute flaccid paralysis, and constitutes one of the serious emergencies in neurology. Typical GBS patients present symmetrical distal and proximal muscle weakness. Weakness continues to progress for up to 1 to 3 weeks after disease onset. Respiratory insufficiency occurs in 25% of patients.[1] The differential diagnosis of GBS is wide. If a patient does not have sensory symptom or sign, disorders such as periodic paralysis, poliomyelitis, myasthenia gravis, electrolyte disturbance, botulism or acute myopathy need to be considered.

GBS is divided into demyelinating and axonal subtypes, acute inflammatory demyelinating polyneuropathy (AIDP) and acute motor axonal neuropathy (AMAN). Different pathophysiologies in each subtype have been elucidated by previous studies. AMAN is strongly correlated with antecedent *Campylobacter jejuni* infection and serum anti-ganglioside antibodies, such as IgG anti-GM1, -GD1a or -GalNAc-GD1a antibodies. Molecular mimicry between GM1 ganglioside and lipooligosaccharides of *C. jejuni* has been established as an important cause of AMAN. In contrast, target molecules or specific autoantibodies for AIDP remain unknown.[1] Nerve conduction studies play an important role in classification of GBS subtypes. AIDP is characterized by prolonged motor distal latencies and increased duration and polyphasia of distal compound muscle action potentials. Most of AIDP patients have abnormal sensory nerve conduction. In contrast, AMAN is associated with reduced CMAP amplitudes suggestive of axonal loss of motor nerve fibers, and with normal sensory nerve conduction.[2]

Periodic paralysis is a skeletal muscle ion channel disorder and produces episodic acute muscle weakness.[3] Hypokalemic periodic paralysis, the commonest form, is often precipitated by carbohydrate load or exercise. Onset age is usually in the first or second decade of life. The patients present an episodic weakness and paralysis tend to occur in the night or early morning. Paralytic attack of hypokalemic periodic paralysis lasts hours to days. Weakness predominates in proximal muscles and tends to spare facial and respiratory muscles. Serum potassium level on symptom onset is low. Decrement in compound muscle action potential amplitude following long exercise test, a neurophysiological examination, is helpful for making diagnosis of periodic paralysis.[3] Despite of careful clinical observation, in the early stage of the disease, periodic paralysis sometimes mimics GBS.

Saroja *et al*. reported a patient with GBS and hypokalemia.[4] Initially, GBS and hypokalemic paralysis were considered as differential diagnosis.

However, serial nerve conduction study results revealed the characteristic neurophysiologic pattern of AIDP: Prolonged distal motor latencies and conduction slowing, which reached a nadir in the clinically recovery stage. The diagnosis of AIDP was made. In addition, hypokalemia, hypomagnesemia with hypocalciuria, and metabolic alkalosis suggested the co-existing of Gitelman syndrome, an inherited renal tubular disorder.

An interesting point here is that AIDP and renal tubular disorder exacerbated at almost same time. Is this incidental? Although GBS is recognized as a peripheral nerve disorder, GBS associated with nephropathy has been reported from the 1970s.[5] Focal segmental glomerulosclerosis, minimal change nephrotic syndrome, and membranous glomerulonephritis are the previously described complicated nephrotic syndromes.[6] GBS often overlaps with dyselectrolytemia due to syndrome of inappropriate anti-diuretic hormone secretion.[7] Increased renal tubular sensitivity to vasopressin was proposed as one of possible mechanisms in one study.[8]

These findings can expand the concept of GBS. Although target antigens appear on both peripheral nerve and kidney are not yet established, such syndrome overlapping GBS and nephropathy may provide new insights into the etiology of GBS.

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