Single vs Serial Nerve Conduction Study in Guillain Barre Syndrome

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Background: Nerve conduction study (NCS) is an important diagnostic tool in Guillain Barré syndrome (GBS). Many electrodiagnostic criteria sets have been proposed to distinguish demyelinating from axonal pathology. Misclassification often occurs in early course of the disease. Moreover, timing and selection of the nerves are crucial. Repeat NCS may provide more definite diagnosis.

Objective: The aim of this study was to describe NCS results and their serial changes in specific nerves and related parameters.

Methods: This was a retrospective and prospective review of medical records of GBS patients, who were at least 15 years and visited to Thammasat University Hospital and Bangkok Hospital Medical Center in Thailand between January 2009 and October 2017. Every patient had at least one nerve conduction study at the time of diagnosis and confirmed by neuromuscular specialist or treating neurologist.

Results: Forty-four patients were recruited. Of these, 23 (52.3%) were female with mean age at presentation of 49.2 years. Most patients were Asian (59.1%) or European (15.9%). Antecedent infections were mainly upper respiratory tract and GI infection. The most common clinical diagnostic subtype was AIDP (63%). Other subtypes were AMAN (15.9%), MFS (11%), pharyngeal-cervical-brachial weakness (9%), and AMSAN (2%). Comparing the difference of demyelinating criteria sets, Albers criteria showed the highest sensitivity (98%) to define demyelinating pattern; whereas, Cornblath criteria was the lowest (53%). On the other hand, Ho (94%) and Hadden (91%) criteria sets demonstrated indifferent diagnostic results. Initial NCS was abnormal in 34 patients from a total of 44 patients (78%). Demyelinating pattern was found in 28 patients (64%), followed by mixed axonal and demyelinating pattern in 6 patients (14%) and equivocal in the rest. Second NCS was performed in 20 patients and the classification was changed in 2 of 20 patients (10%), shifting from demyelinating to axonal subtypes in final NCS. This might reflect reversible conduction block in early axonal GBS. Demyelinating pattern was more prevalent in lower limbs (tibial and peroneal nerve), which were most defined by slow conduction velocity and conduction block. While in upper limb, median nerve was the most commonly affected, based on the conduction velocity, distal latency, and temporal dispersion. Sural sparing pattern was common and it was present in 44/55 times (80%) in AIDP according to Albers criteria.

Conclusion: AIDP is the most common subtype of GBS in Thai tertiary care centers. Albers criteria are the most sensitive criteria; whereas, Cornblath criteria are the lowest. Initial NCS reveals abnormality in 78% of patients, while serial NCS demonstrates subtype change in 10% of patients, following demyelinating to axonal pattern. Tibial and peroneal nerves are most frequently affected. Appropriate selection of the studied nerves and classification criteria, combined with serial NCS are important to identify accurate GBS subtypes.

Keywords: Guillain Barre syndrome, Nerve conduction study, Serial, Single, Electrophysiology