

Utilization of Nerve Conduction Studies for the Diagnosis of Polyneuropathy in Patients with Diabetes: A Retrospective Analysis of a Large Patient Series

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Abstract

Background:

Diabetic polyneuropathy (DPN) is a disabling complication of diabetes mellitus. A population-based analysis of physician utilization of nerve conduction studies (NCS) for the assessment of DPN was conducted.

Methods:

All electrodiagnostic encounters over a 30-month period using a computer-based neurodiagnostic instrument linked to a data registry were analyzed retrospectively. The DPN case definition was abnormal sural and peroneal nerve conduction.

Results:

The study cohort consisted of a total of 63,779 electrodiagnostic encounters performed by 3468 physician practices. Primary care and internal medicine physicians represented 80.1% of the practices and accounted for 65.7% of the encounters. Endocrinologists represented 4.6% of the practices and 20.1% of the encounters. The demographics of patients were 52.7% female; 63.4 ± 11.8 (mean ± standard deviation) years (age); 168.1 ± 10.9 cm (height); 92.2 ± 22.6 kg (weight); and 32.6 ± 7.2 kg/m² (body mass index). The most common peroneal abnormality was F-wave latency (33.6%). The sural nerve response latency and amplitude parameters had similar abnormality rates (58.3 and 62.7%). DPN was identified in 52.6% of the encounters; in another 19.3% no neuropathy was found.

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Abbreviations: (BMI) body mass index, (CMAP) compound muscle action potential, (DML) distal motor latency, (DPN) diabetic polyneuropathy, (DSL) distal sensory latency, (F-wave) F-wave latency, (NCS) nerve conduction studies, (PM&R) physical medicine and rehabilitation, (SNAP) sensory nerve action potential

Keywords: diabetic polyneuropathy, nerve conduction study, peroneal nerve, sural nerve

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Abstract cont.

Conclusions:

For over 70% of the patients, the specific diagnostic question of the presence of DPN was addressed by NCS with evidence-based criteria. The demographic features were strongly associated with risk of diabetes and DPN, suggesting that NCS were applied to appropriate demographic subgroups. The rate of DPN was also comparable to levels seen by academic electromyography laboratories. In 32.6% of the encounters the NCS suggested a posttest diagnosis other than DPN. This rate was similar to the results of referral to traditional electromyography laboratories. This study demonstrated that NCS using computer-based electrodiagnostic equipment was a suitable tool for the diagnosis of DPN. Furthermore, this technology permits examination of DPN in large populations.

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