New Triad Defines Distal Symmetrical Polyneuropathy

The combined case definition should be particularly useful for clinical and epidemiologic research design.

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The combination of neuropathic signs, symptoms, and abnormal electrodiagnostic studies provides the most accurate diagnosis of distal symmetrical polyneuropathy, according to the authors of a new case definition for the noninflammatory nerve disease.

Considered independently, none of the triad offers perfect diagnostic accuracy in predicting the presence of the peripheral nervous system problem, wrote John D. England, M.D., and colleagues in the multidisciplinary Polyneuropathy Task Force. Yet various combinations of the three alter the degree of diagnostic certainty, which, for polyneuropathy, follows a continuum of probability, the authors stated (Neurology 2005;64:199-207).

The task force, comprising physician representatives from the American Academy of Neurology, the American Association of Electrodiagnostic Medicine, and the American Academy of Physical Medicine and Rehabilitation, conducted a systematic literature review of prospective cohort surveys and case review studies. To determine the accuracy of the diagnostic predictors identified through the review, the panel calculated sensitivities and specificities of each, then rank-ordered, from highest to lowest, the likelihood of a positive diagnosis given various combinations of the predictors. They determined, for example, that the highest likelihood of distal symmetric polyneuropathy occurs with a combination of multiple symptoms, multiple signs, and abnormal electrophysiologic studies. Additionally, when multiple symptoms and signs are present but electrophysiologic findings are not available, the likelihood is downgraded to modest, and when signs are discordant with electrophysiologic findings, the likelihood of a positive diagnosis is further diminished.

The evidence-based recommendations evolved from a treatment guideline into a case definition when the task force found the definition of polyneuropathy was inconsistent across the available studies, hampering comparisons, the authors wrote.

The absence of formal criteria for the diagnosis of distal symmetric polyneuropathy has hindered research, said Dr. England of Deaconess Billings (Mont.) Clinic.

Based on the literature review, data classification, and formal consensus process, the authors reached these conclusions:

► Neuropathic symptoms alone have relatively poor diagnostic accuracy in predicting the presence of polyneuropathy. Multiple neuropathic symptoms are more accurate predictors than are single symptoms, and should be weighted as such.

► Signs are better predictors than are symptoms, and should be weighted as such.

► A single abnormality upon examination is less sensitive than multiple abnormalities; thus, physicians should look for combinations of signs.

► Relatively simple examinations have the same diagnostic accuracy as do complex scoring systems.

► The high degree of inconsistency among studies describing the accuracy of quantitative sensory testing precludes the inclusion of such testing in the case definition.

These conclusions were gleaned from studies specific to distal symmetric polyneuropathy. Using the evidence-based conclusions as its guide, the task force developed an ordered set of case definitions ranked from highest to lowest based on the likelihood of disease, depending on the presence or absence of specific signs, symptoms, and electrophysiological results. (See chart.)

Symptoms of distal symmetric polyneuropathy begin distally in the feet and may be sensory (numbness, burning, dysesthesias, allodynia, and prickling paresthesias), motor (often weakness in the distal legs), or both. On examination, signs of the condition include abnormalities of primary sensory modalities (pain, touch, hot, cold, vibration, and proprioception), motor system, tendon reflexes (especially depressed or absent ankle jerks), or autonomic system.

With respect to electrodiagnostic evaluations, they are recommended but not required to fulfill the case definition criteria. Of the options, nerve conduction studies (NCS) are the most informative, providing a sensitive measure of the functional status of sensory and motor nerve fibers and therefore adding a higher level of specificity to the diagnosis. For this reason, they should be included in the assessment of polyneuropathy, with the caveat that they are neither sensitive nor specific enough on their own to be exclusive diagnostic criteria, the authors wrote. Because no formal consensus exists regarding the best NCS protocol for diagnosing polyneuropathy, the task force developed recommendations based on electrophysiologic principles that combine the highest sensitivity, specificity, and efficiency for diagnosing distal symmetric polyneuropathy. (See sidebar.)

Quantitative sensory testing is not included as part of the final case definition because the sensitivities and specificities of the psychophysical tests vary considerably, and they have greater inherent variability, making standardization difficult, the authors noted. Also excluded are quantitative autonomic tests, because they are not routinely performed in all medical centers.

One possible limitation to the case definition is the reliance on evidence predominantly related to diabetic peripheral neuropathy, the most common and rigorously studied variety. Some "uncertainty exists with respect to the generalization of the case definition to distal symmetric polyneuropathy associated with other etiologies," the authors wrote.

The new case definition should be particularly useful for clinical and epidemiologic research design and implementation, the authors wrote. Formalizing the case definition "will ensure greater consistency of case selection," and will go a long way toward standardizing and facilitating clinical research, Dr. England said. ■

Clinical Findings Most Predictive of Distal Symmetrical Polyneuropathy

Neuropathic symptoms	Decreased/ absent ankle reflexes	Decreased distal sensation	Distal muscle weakness/ atrophy	Nerve conduction studies	Ordinal likelihood
Yes	Yes	Yes	Yes	Abnormal	++++
No	Yes	Yes	Yes	Abnormal	++++
Yes	Yes	Yes	No	Abnormal	++++
Yes	Yes	No	No	Abnormal	++++
Yes	No	Yes	No	Abnormal	++++

Notes: Diagnostic certainty for polyneuropathy follows a continuum of probability. The panel rated from highest (++++) to lowest (–) the likelihood of distal symmetric polyneuropathy based on various combinations of diagnostic parameters.

Source: Polyneuropathy Task Force

Protocol for Nerve Conduction Studies

The Polyneuropathy Task Force recommended the following protocol for a nerve conduction study (NCS):

► Sural sensory and peroneal motor NCSs should be performed in one lower extremity. Normal results from both studies preclude a diagnosis of distal symmetric polyneuropathy.

► Abnormal sural sensory or peroneal motor NCS results warrant an NCS of at least the ulnar sensory, median sensory, and ulnar motor nerves in one upper extremity and, if desired, a contralateral sural sensory and one tibial motor NCS. Examiners should be cognizant of the possibility of abnormal median and ulnar studies because of nerve compression at the wrist or ulnar neuropathy at the elbow.

► An absent response for any of the sensory or motor nerves studied warrants an NCS of the contralateral nerve.

► An absent peroneal motor response calls for an ipsilateral tibial motor NCS.

Minimal criteria for electrodiagnostics confirmation of distal symmetric polyneuropathy is an abnormality of any attribute of nerve conduction in two separate nerves, one of which must be the sural nerve.

Increase Flow Rate if Cluster Patients Don't Respond to Oxygen

LAS VEGAS — The flow rate of oxygen routinely prescribed to abort cluster migraine is too low to be effective in many patients, Todd D. Rozen, M.D., said at a symposium sponsored by the American Headache Society.

Clinicians typically prescribe flow rates of 7-10 L/min, said Dr. Rozen of the Michigan Head-Pain and Neurological Institute in Ann Arbor. About 30% of patients fail to respond to flow rates in this range.

Dr. Rozen described three patients whose headaches were apparently refractory to oxygen but who all responded well when the flow rate was pushed to 15 L/min—about the maximum flow rate delivered by most medical-grade oxygen regulators (Neurology 2004;63:593).

"I'm now telling my patients that you're not resistant to oxygen until you try 15 L/min," Dr. Rozen said.

There are a number of caveats regarding oxygen therapy for cluster headache. The gas must be delivered through a nonrebreather face mask, and patients must be cautioned strongly about the highly flammable nature of pure oxygen. In addition, the higher flow rates may be dangerous in patients with chronic obstructive pulmonary disease.

Oxygen is thought to exert its effect on cluster headaches through cerebral arterio- and vasoconstriction. Many people whose headaches appear refractory to oxygen therapy are smokers; according to the pulmonary literature, smokers exhibit less vasoconstriction in response to 100% oxygen than do nonsmokers.

Dr. Rozen hypothesized that in some individuals, a higher oxygen flow rate is needed to obtain a clinically meaningful degree of vasoconstriction.

The goal of abortive treatment is to stop the pain within 10-15 minutes.

Oxygen therapy is a good choice for patients whose cardiovascular risk factors render them unsuitable candidates for injected sumatriptan. "I don't know how many times I've seen cluster patients who have never tried oxygen," Dr. Rozen said.

—Robert Finn