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LETTER TO THE EDITOR

Focus on nerve fiber type: A diagnostic strategy for diabetic polyneuropathy

I read the commentary article by Sasaki and Kishimoto[1] about Diagnostic strategy for diabetic polyneuropathy: Focus on nerve fiber type and magnetic resonance neurography with interest. The authors carried out an updated review of the neurophysiological and imaging aspects specifically focusing on the role of magnetic resonance neurography in the diagnosis of diabetic polyneuropathy. I have the following comments.

I agree with the authors when they state that the magnetic resonance neurography lesion load reflects middle-to-large-fiber dysfunction, but not small C-fiber dysfunction[1]; the compromise of small fibers is undoubtedly a great challenge for both the clinician and the neurophysiologist. To selectively stimulate the nociceptive A-delta and C fibers, some techniques have been developed, avoiding the simultaneous stimulation of non-nociceptive A-beta fibers.[2]

In 2000, Kaube *et al.*[3] developed a new superficial concentric planar electrode for non-invasive stimulation of cutaneous nociceptive fibers. Due to the concentric geometric shape and short anode–cathode distance, a high current density can be achieved at relatively low current intensities, causing the selective depolarization of nociceptive fibers in the superficial layer of the dermis, without recruiting deeper non-nociceptive thick fibers. This nociceptive evoked potential obtained through the concentric stimulator known as pain-related evoked potentials (PREP; Figure 1), should be a practical choice, because it is a non-invasive and reliable electrophysiological procedure that can assess signal transmission of A-delta fibers without great expense. PREP detects dysfunctions of small fibers in generalized polyneuropathies related to systemic disorders.[4]

In 2020, Siedler *et al.*[4] published the study of 108 patients with neuropathy (23 with large-fiber neuropathy, 80 with mixed-fiber neuropathy and 5 with small-fiber neuropathy) who were compared with 49 healthy controls. In addition to PREP, medical history, neurophysiological studies of nerve conduction, quantitative sensory tests and skin biopsy were applied. The authors conclude that PREP is also a useful screening method for the pathology of the A-delta fiber in patients with simultaneous pathology of large fibers, and the lack of response in the PREP indicates advanced stages of nerve fiber damage.

Recordings of PREP are a new well-established tool for assessing cranial and somatic nociceptive systems, which, due to their ease of execution and low cost, should become a useful auxiliary test in the diagnosis of neuropathies, especially of small fibers.

Currently, neurophysiological methods for assessing possible small-fiber neuropathy consist of a sympathetic skin response, quantitative sensory test, reflex of the sudomotor axon, autonomic tests and laser-evoked potentials. These techniques are partially invasive, time-consuming, expensive and, therefore, only partially useful in the clinical routine. The use of new electrophysiological techniques, such as PREP, will undoubtedly add a new step on the ladder for the diagnosis of small-fiber neuropathy, in addition to facilitating more comprehensive studies that allow us to reach more reliable conclusions.

I thank the authors for an excellent review of a relevant topic in neurology and clinical neurophysiology.

DISCLOSURE

The author declares no conflict of interest.

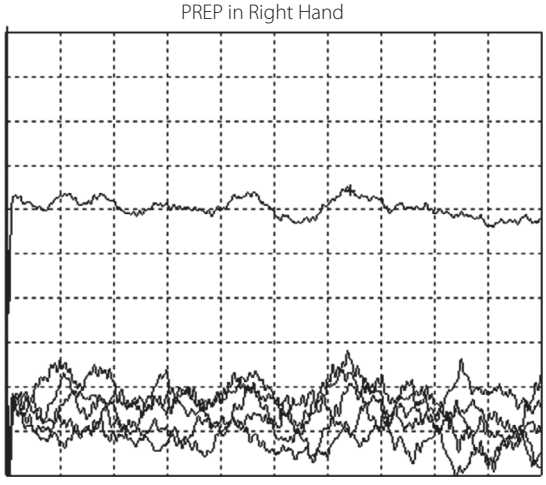

Figure 1 | Normal pain-related evoked potential (PREP) in a 63-year-old man.

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