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iMAX: a new tool for assessment of motor axon excitability

12/ Nerve and muscle excitability

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Objectives

Objective : We develop a novel and practical electrodiagnosis (EDX) technique called the iMAX to assess peripheral motor axon excitability in patients with peripheral neuropathies (1). This technique allows to measure nerve excitability in few minutes with a simple EDX device and classic recording settings. We conducted a multicenter study to establish the reliability of this new technique.

Content

Methods:
The lowest stimulus intensity allowing a response of 0,1mV (threshold) and the lowest stimulus intensity allowing a maximal response (iMAX) were prospectively derived from three nerves (median, ulnar, fibular) in four university centers (Liège, Marseille, Fraiture, Nice). iMAX procedure was applied twice in 28 healthy volunteers to test the reproducibility and once in 32 patients with peripheral neuropathies as Charcot-Marie-Tooth (CMT1a), chronic inflammatory demyelinating polyneuropathy (CIDP), Guillain-Barré syndrome (SGB) or axonal neuropathy.
Results:
Healthy volunteers results were not significantly different between centers. Correlation coefficients between test and retest were moderate (> 0.5). Upper limits of normal were established using the 95th percentile. Comparison of volunteers and patient groups indicated significant increases in iMAX parameters especially for the

CMT1a and CIDP groups. In CMT1a, iMAX abnormalities were homogeneous at the three stimulation sites, which was not the case for CIDP.
Conclusions:
The iMAX procedure is reliable and allows the monitoring of motor axon excitability disorders. It is a fast, non-invasive procedure, easily applicable without specific software or devices.

1. Milants C, Benmouna K, Wang FC. iMAX: A new tool to assess peripheral motor axonal hypoexcitability. Clinical Neurophysiology. 1 déc 2017;128(12):2382-3.

Key words

Excitability, Peripheral nerve, Motor axon, Chronic inflammatory demyelinating polyneuropathy, Charcot-Marie-Tooth, Guillain-Barré syndrome