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Electrophysiological status of sural nerve in type 2 diabetic patients before overt peripheral neuropathy

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Neuropathies in type 2 diabetes mellitus (T2DM) patients are well documented. However, electrophysiological changes in their peripheral nerves, particularly before overt peripheral neuropathy have received much less attention. Hence, we studied electrophysiological status of bilateral sural nerves in T2DM patients who do not show clinical evidence of peripheral neuropathy. We selected 35 male patients with T2DM and 35 age- and sex-matched healthy controls without any clinical evidence of peripheral neuropathy and other infectious, systemic, metabolic, and neuropsychiatric illnesses after informed written consent. Nerve conduction study of bilateral sural nerves of both the groups was performed at lab temperature of 26±2ºC by antidromic method of stimulation. Latency, conduction velocity, amplitude, and duration of sural sensory nerve action potential (SNAP) were measured. In our study, we found reduced amplitudes of bilateral sural SNAP in T2DM patients compared to the controls [left (12.46 ± 3.77) μV vs. (16.42 ± 4.58) μV, p=0.000; right (11.96 ± 4.45) μV vs. (16.62 ± 6.20) μV, p=0.001] though they were above the normal cut-off value of ≥4 μV. Durations of bilateral sural SNAP were prolonged in T2DM patients compared to the controls [left (1.99 ± 0.38) ms vs. (1.67 ± 0.27) ms, p=0.000; right (1.92 ± 0.47) ms vs. (1.55 ± 0.33) ms, p=0.000]. Reduced amplitude of sural SNAP suggests axonal loss, whereas prolonged sural SNAP duration is seen in polyneuropathies. Hence, we concluded that electrophysiological alterations suggestive of peripheral neuropathy occur in T2DM patients before overt peripheral neuropathy. Early detection of peripheral neuropathy in T2DM patients helps to prevent long-term complications of diabetes mellitus such as foot ulcers and amputations.

Biography

Raju Panta earned professional medical degrees of MBBS and MD in Basic and Clinical Physiology, from the nationally and internationally accredited medical colleges in Nepal. He was awarded with a "Certificate of Expertise in Electrophysiology" after completion of his doctorate thesis during his residency. His thoughtful ideas inspired him to accomplish research work on Diabetes Mellitus, where he studied electrophysiological evidences of peripheral and central neuropathies in type 2 diabetes mellitus patients before they develop features of peripheral neuropathy. Working as a faculty of Physiology at Trinity School of Medicine, St. Vincent and the Grenadines. He has demonstrated excellence in teaching as evidenced by four "SGA awards" in recognition of best professor. His organizational memberships include the American Physiological Society, International Association of Medical Science Educators, Association for Medical Education in Europe, Physiological Society of Nepal, and Nepal Medical Council..

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