

Ultrasound Support in the Diagnosis of Asymptomatic and Symptomatic Diabetic Peripheral Neuropathy: A cross-sectional observational study

Abdallah El Sayed Allam¹, Mohamed Zaghoul², Ahmed Amine El Oumri³, Abdullah AlKharabsheh⁴, Ammar Salti⁵, Felice Galluccio⁶, Ece Yamak Altinpulluk^{7, 7, 8}, Tolga Ergonenc⁹, D. Nada¹⁰

1. Physical Medicine, Rheumatology and Rehabilitation, Tanta University Hospitals & Faculty of Medicine, Tanta University, Tanta, EGY 2. Department of Physical Therapy, Tanta University School of Medicine, Tanta, EGY 3. immunohematology cellular therapy, Medical school oujda / Mohammed Vi university hospital of Oujda, Oujda, MAR 4. King Abdullah University Hospital, Jordan University of Science and Technology, Amman, JOR 5. Anesthesia and Pain Medicine, Cleveland Clinic, Abu Dhabi, ARE 6. Rheumatology - Experimental and Clinical Medicine, University of Florence, Florence, ITA 7. Anesthesiology Research Office, Ataturk University Medical School, Erzurum, TUR 8. Outcomes Research, Anesthesiology Institute, Cleveland Clinic Foundation, Cleveland, USA 9. Department of Anesthesia and Reanimation, Sakarya University, Sakarya, TUR 10. Physical Medicine and Rehabilitation, Tanta University School of Medicine, Tanta, EGY

Corresponding author: Abdallah El Sayed Allam, dr_3llam2007@hotmail.com

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Abstract

Objectives: To determine the advantages of neuromuscular ultrasound as instrumental support in the diagnosis of asymptomatic as well as symptomatic diabetic peripheral neuropathy in comparison with nerve conduction studies.

Methods: This cross-sectional study was performed with ethical committee approval and obtaining consent from the patients' groups on 50 consecutive types 2 diabetic patients (25 symptomatic and 25 asymptomatic) and 25 volunteers matched to the patients in age and sex. Diabetic patients with radiculopathy, entrapment neuropathy, thyroid dysfunction or hepatitis C/B infection, chronic liver or renal disease, other types of neuropathies, anatomic variations were excluded. Clinical and neurological examination, laboratory, neuromuscular ultrasound, and electrophysiological assessment were performed on patients and control.

Results: There was a significant difference between asymptomatic and symptomatic patients as regard motor & sensory nerve conduction study parameters as well as late responses of all studied nerves (median, ulnar, peroneal, and tibial) except for the femoral nerve where there was no significant difference. Regarding the cross-sectional area (CSA) of tibial nerves, there was a significant difference between the three groups. (Figure 1, 2) Moreover, there was a positive correlation between CSA of the tibial nerve and distal motor latency, conduction velocity, and late responses, whereas there is a significant negative correlation between CSA of the tibial nerve and distal amplitude of its motor conduction.

Conclusion: CSA of the tibial nerve proximal to the tarsal tunnel can be used as a screening tool for diabetic peripheral polyneuropathy. Further research studying the cross-sectional area of sural and saphenous nerves in correlation with electrophysiologic studies should be done to increase the value of neuromuscular ultrasound in detecting diabetic polyneuropathy. For further studies, hypo-echogenicity and swelling of the fascicles and nerve elastography might be done to detect the most sensitive and early parameter affected in diabetic peripheral neuropathy.

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Abstract

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