Reprint from The Review of DIABETIC STUDIES Vol 15 2019

The Review of DIABETIC STUDIES

LETTER

Automated Measurement of Sural Nerve Conduction is a Useful Screening Tool for Peripheral Neuropathy in Type 1 Diabetes Mellitus

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Manuscript submitted August 31, 2019; accepted September 3, 2019

To the Editor

We examined the diagnostic performance of the portable NC-stat® DPNCheck™ device (Neurometrix, Inc., Waltham, MA, USA) for automated measurement of sural nerve conduction in the diagnosis of diabetic peripheral neuropathy (DPN) in subjects with type 1 diabetes mellitus (T1DM). We included 53 consecutive T1DM subjects (28 men) with mean age 36.9 years and mean T1DM duration 14.6 years. Exclusion criteria were B12 depletion, alcohol abuse, and other causes of peripheral neuropathy.

The reference method was the Neuropathy Disability Score (NDS) with a threshold NDS ≥ 3 [1]. Determination of sural nerve automated NCS was carried out using the portable NC-stat® DPNCheck™ device [2]. Nerve conduction velocity and sensory nerve action potential amplitude were measured bilaterally. Automated NCS was dichotomously considered as normal or abnormal as follows: abnormality was present if at least one of the two aforementioned neurophysiological parameters was outside normal range in at least one leg [2].

The NC-stat® DPNCheck™ device yielded 95.7% sensitivity, 93.3% specificity, 91.7% positive predictive value, 96.6% negative predictive value, 14.3 positive likelihood ratio, and 0.05 negative likelihood ratio.

Given its excellent sensitivity and negative predictive value, as well as its very low negative likelihood ratio, the device proved to be very valuable mainly for the exclusion of DPN. These findings are in line with our previous experience in type 2 diabetes mellitus [2]. The well-known simplicity of the examination without the need for specialized personnel or long training adds to its value [3]. Therefore, the diagnostic benefit of the device as a screening tool for DPN is obviously present in both diabetes types.

The advantage of this study is the use of a standardized NDS for a simple diagnosis of DPN applicable in T1DM and T2DM. The limitations of the study include the small subject series and the inclusion of subjects from a tertiary care setting, which calls for caution before generalization.

In conclusion, the findings of this study suggest that the NC-stat® DPNCheck™ device yields high sensitivity and specificity for the diagnosis of DPN in T1DM. Based on its very high sensitivity and negative predictive value, as well as its very low negative likelihood ratio, the primary benefit of the device appears to be the exclusion of DPN. Our new findings confirm similar previous experiences in T2DM [2]. Overall, there appears to be a role for

the NC-stat® DPNCheck™ device for more widespread DPN screening in both diabetes types [3-5].

Disclosures: NP has been an advisory board member of TrigoCare International, Abbott, AstraZeneca, Elpen, MSD, Novartis, Novo Nordisk, Sanofi-Aventis, and Takeda. He has participated in sponsored studies by Eli Lilly, MSD, Novo Nordisk, Novartis, and Sanofi-Aventis, and he received honoraria as a speaker for AstraZeneca, Boehringer Ingelheim, Eli Lilly, Elpen, Galenica, MSD, Mylan, Novartis, Novo Nordisk, Pfizer, Sanofi-Aventis, Takeda, and Vianex. NP also attended conferences sponsored by TrigoCare International, AstraZeneca, Boehringer Ingelheim, Eli Lilly, Novartis, Novo Nordisk, Pfizer, and Sanofi-Aventis.

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