Assessment of Small Fiber Neuropathy through a Quick, Simple and Non Invasive Method in a German Diabetes Outpatient Clinic

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Abstract

Introduction: Sudomotor dysfunction is one of the earliest neurophysiologic abnormalities to manifest in distal small fiber neuropathy. SUDOSCAN was developed to provide a non invasive, quick, simple and quantitative measurement of sweat function. The aim of this observational study was to assess sweat function in a diabetes outpatient consult clinic in Germany.

Methods: The study was conducted from February 2009 to March 2011 on patients of a diabetes outpatient clinic in Germany with type 1 and type 2 diabetes, and was conducted parallel to standard care. Sweat function was evaluated by measuring the electrochemical conductance (ESC) of the hands and feet. The method’s reproducibility between 2 devices and a follow-up according to insulin administration were also assessed.

Results: 52 patients with type 1 diabetes and 115 patients with type 2 diabetes (69 receiving insulin) were involved in this observational study. Hand and foot conductances were lower in patients with type 2 diabetes when compared to patients with type 1 diabetes. A slight decrease in hand and foot conductances was observed in patients with type 2 diabetes without insulin, while an increase was observed in patients receiving insulin ( − 3.8 ± 9.7 vs. 1.0 ± 9.7 μS, p = 0.02 for the hands and − 2.2 ± 7.5 vs. 4.1 ± 8.8 μS, p < 0.001 for the feet). Coefficient of correlation between measurements performed with the 2 different devices was 0.85 for hands and 0.93 for feet, p < 0.001. No safety concern was reported and none of the subjects experienced discomfort during the tests.

Conclusion: This preliminary study shows that the assessment of small C fiber neuropathy can be performed non invasively, quickly and effectively in standard diabetes outpatient practice with very good reproducibility. The observation that electrochemical skin conductance improves with intensified insulin treatment must be confirmed in a clinical study performed on a larger population.