A new simple method for assessing sudomotor function: Relevance in type 2 diabetes

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**AIM:** The current sudomotor function tests are too time-consuming to be used for diabetic patients in daily practice. EZSCAN is a new, patented technology that measures electrochemical skin conductance (ESC) through reverse iontophoresis and chronoamperometry. The aim of the present study was to assess the sensitivity, specificity and reproducibility of the method in type 2 diabetic patients in comparison to control subjects with no risk of diabetes.

**METHODS:** A total of 133 type 2 diabetic patients and 41 control subjects were tested. Participants placed their hands and feet on nickel electrodes, and an incremental low direct current was applied to the anode for 2 min. ESC was calculated from the resulting voltage and generated current. ESC diagnostic accuracy was analyzed by ROC curve modeling, and reproducibility was assessed using Bland-Altman analysis.

**RESULTS:** The ESC of hands and feet was significantly reduced in diabetic patients (53±16μSi and 67±14μSi, respectively) compared with control subjects (68±16μSi and 80±7μSi, respectively; P<0.0001). ESC values had a sensitivity of 75% and specificity of 100%, with an area under the ROC curve of 0.88 at a threshold of 50% on the EZSCAN scale. Coefficients of variation in hand and foot measurements were 15 and 7%, respectively.

**CONCLUSION:** The good sensitivity, specificity and reproducibility of EZSCAN make it a feasible alternative for assessing sudomotor dysfunction, a clinical manifestation of autonomic neuropathy in diabetic patients. The test takes<3min to perform, and requires neither special patient preparation nor medical personnel training.