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The association between Neuropad testing with foot ulceration in diabetes N. Tentolouris, N. Papanas, G. Panagoulas, D. Tessic, S. Z. Kamenov, C. Manes, S. Bousboulas, E. Jude

Aims: Cross-sectional data have shown that dryness of the skin of the feet assessed by either sympathetic skin response or Neuropad testing has been associated with foot ulceration in patients with diabetes. The aim of the present study was to examine the association between Neuropad testing with foot ulceration in patients with diabetes.

Patients and methods: A total of 308 patients with diabetes (155 females and 153 males; 280 with type 2 diabetes; mean age 62.8 ± 11.3 years; mean diabetes duration 12.4 ± 9.7 years) with no history of foot ulceration were recruited in the study from the year 2005 until the year 2010. At baseline participants were evaluated for neuropathy status using the neuropathy disability score (NDS). Patients with NDS 0-2 were considered as having no neuropathy, those with NDS 3-5 as having mild neuropathy and those with NDS ≥ 6 as having severe neuropathy. In addition Neuropad testing was performed and the results were evaluated as normal or abnormal based on complete colour change of the test after 10 min of application.

Results: At baseline, 148 patients (48.1%) did not have neuropathy, 82 (26.6%) had mild neuropathy and 78 (25.3%) had severe neuropathy. Neuropad testing was normal in 128 (41.6%) and abnormal in 180 (58.4%) patients. The mean follow-up was 5.5 ± 2.5 years. During this time, 55 (17.9%) patients developed foot ulcers. At baseline, patients who developed foot ulcers were older ($p=0.03$) and had longer diabetes duration ($p=0.01$). After adjustment for age, gender and duration of diabetes, abnormal Neuropad testing at baseline was associated with increased odds (OR, 95% confidence intervals) for foot ulceration [4.2 (1.8-9.8)]. Similarly, the adjusted OR of NDS ≥ 6 vs. NDS <6 for foot ulceration was 8.5 (3.3-21.7).

Conclusion: Abnormal Neuropad testing is associated with a 4-fold higher risk for foot ulceration. Neuropad testing can be included in the screening tests for the prevention of foot ulceration in patients with diabetes.