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The predictive value of Neuropad® in patients with high risk for diabetic foot ulcerations

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Background: Decreased foot sweating, as a consequence of autonomic neuropathy, is considered as a foot ulceration risk factor by decreasing skin resistance to trauma. Neuropad® (a cobalt chloride impregnated plaster) was designed as a easy to use device, for qualitative evaluation of normal or decreased sweating of the foot skin. The history for foot ulcerations is the most important risk factor for (re)ulcerations/amputations in diabetic patients. **Patients and methods:** We have selected 10 diabetic patients with healed neuropathic foot ulcers in the past and with ankle/brachial blood pressure index > 0.9, and 10 genders, age and diabetes type matched patients without history of foot ulcers (controls). After obtaining the informed consent, all the patients were evaluated by the same investigator (N.M, F.E) in standardized conditions, with the 10g monofilament (in for points), calibrated tuning fork and biothesiometer (tip of the great toe). Than the Neuropad® plaster was applied on the sole of the right foot at the level of the head of the first metatarsal bone. The interpretation of the results was as recommended by the producer. The sensitivity, specificity, positive and negative predictive value (PPV, NPV) for Neuropad®, , were calculated and compared with those for monofilament (lack of perception in at least one point), calibrated tuning fork (≤ 6 units) and biothesiometer (≥ 25 mV), having the patients with history of foot ulcer as “true positive”. **Results:** There were 8 males and 9 with type 2 diabetes with comparable mean age (65.1 ± 9.98 yr vs $64.2 \pm 8,8$ yr) in each group. The controls had a shorter duration of diabetes (8.6 ± 7.8 vs 12.7 ± 11.3 yr vs) and a higher mean of HbA1c (8.9 ± 1.57 vs 7.9 ± 1.75). The same proportion of them was orally or insulin or insulin+oral treated in each group. The sensitivity and specificity for Neuropad® / monofilament/calibrated tuning fork and biothesiometer were 80%/ 80%/100% and 90% and respectively 50%/100%/40% and 80%. For the PPV and NPV the results were 61.5%/100%/60% and 77.8% and respectively 71.4%/83.3%/80% and 72.7%. **Conclusions:** In our study Neuropad® had comparable performances with the well validated other screening instruments with the advantage of being easy to use even at home by the patients.