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Evaluation of Neuropad in patients with end-stage renal disease under haemodialysis or with renal transplantation

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Background and aims: In patients with diabetes, haemodialysis is an independent risk factor for lower limb amputation. We explored autonomic function (Neuropad®) in patients on haemodialysis or renal transplantation. **Materials and methods:** Overall, 97 patients were on haemodialysis: prevalence 28.2 and incidence 9.2 for 2011 per 100,000 inhabitants. We divided haemodialysed patients into: G1 37 (38.1%) nephroangiosclerosis, G2 28 (28.9%) diabetic nephropathy, G3 n=18 (18.6%) glomerulonephritis and G4 (n=14) with other conditions. We also included 22 patients with renal transplantation. Patients were examined by Neuropathy Disability Score (NDS) and by the Neuropad. **Results:** Among dialysed patients, 28 (28.9%) had diabetes with mean age and diabetes duration 41.3±11.4 years and 25.7±4.7 years, respectively, in T1DM and 62.3±8.98 years and 17.9±11.2 years, respectively, in T2DM. Among transplanted patients, 6 (27.3%) had diabetes: mean age and diabetes duration were 50.7±10.0 years and 25.7±4.7 years, respectively, in T1DM, and 62.3±8.98 years and 17.9±11.2 years, respectively, in T2DM. Time until Neuropad colour change in dialysed patients was 28.1±7.9 min vs. 7.9±6.3 minutes in transplanted patients ($p<0.01$). Impressively, time to colour change was abnormally high in each of G1-G4. Neuropad was abnormal in 95 (97.9%) dialysed and 4 (18.2%) transplanted patients ($p<0.01$). There was a significant difference in NDS between G1-G4 groups ($p<0.01$): in particular, NDS was significantly ($p<0.01$) higher in G2 than in each other dialysis group. Moreover, NDS was significantly ($p<0.01$) higher in dialysed than in transplanted patients. Frequency of PAD was significant in G2 ($p<0.01$). End-stage diabetic foot pathology was present in 13 (46.4%) out of the 28 diabetic patients on haemodialysis: 3 critical limb ischaemia, 3 Charcot osteoarthropathy, 2 neuroischaemic ulcer, 2 minor amputation, 3 major amputation. In 11 out of these 13 patients, NDS was 10. **Conclusions**: Neuropathy is a major risk factor for severe diabetic foot complications in patients on haemodialysis. This applies to dialysed patients with all underlying conditions, but holds especially true for diabetic nephropathy. The risk can be evaluated by Neuropad and NDS. Finally, renal transplantation appears to exert a beneficial effect, but this remains to be shown in prospective studies.