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Patterns of foot pressure distribution in healthy diabetic patients, patients with diabetic neuropathy, and patients with healed foot ulcers.

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Objective: It is believed that changes in biomechanics are important in pathogenesis of diabetic foot. Theoretically, one can suppose that impairment of foot pressure distribution can gradually progress from diabetic patients without significant foot pathology toward patients with diabetic ulcers. We aimed to compare foot pressure distribution in patients with different foot pathology. **Method:** 98 diabetic patients (age 53,8±13,9 years, duration of DM 17,8±9,4 years) were divided in 3 groups: without foot pathology (DM, n=14), with neuropathy (DN, n=43), with neuropathy and healed foot ulcers (DU, n=41). Patients with DN and DU were comparable by age (56,5±11,8 and 55,2±12,8) and duration of diabetes (19,2±9,2 and 19,1±9,5 yrs) but differ significantly from DM for both parameters (39,6±17,7 and 9,2±5,2 yrs). Pressure distribution measurements were performed with emed-AT system. **Results:** The loading time of the total foot in DU patients was longer compared with DM group but did not significantly differ from DN patients: 1196±171 and 1121±126 ms ($p<0,05$) and 1182±205 (ns). In general, loading patterns in DN and DU patients were not different, except increase of peak pressures (PP) in the forefoot and toes in DU group: 439±186 and 528±227 kPa for forefoot and 152±102 and 170±116 kPa for toes ($p<0,05$ for both). PP in the forefoot was lower in DM patients compared with DU and DN groups: 389±179 kPa ($p<0,001$ between groups). Force-time integrals in toes were higher in DM patients compared with DN and DU ones: 77±40, 65±34 and 68±35 N*s ($p<0,05$ between DM and other two groups). **Conclusions:** This data suggests the significant differences in walking pattern and loading in patients with and without neuropathy. As the pathology becomes more severe the load in the forefoot increases. Diabetic neuropathy is characterized with smaller role of toes in push-off. Small increase of loading of the toes in patients with diabetic ulcers can be explained with increase of stiffening of methatarsophalangeal joints.