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The effect of joint mobility on plantar pressures and walking capacity in diabetic patients with and without previous foot ulceration.

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Introductions: Limited joint mobility (LJM) is a common manifestation of diabetes. The condition is seen in the hands but also affects the ankle and foot, may predispose to increased plantar pressure and foot ulceration and may lead to difficulties with walking. The objective of this project was to assess joint mobility of the foot and more proximally at the knee and hips to investigate the relationship between joint mobility of the lower extremity and plantar pressures in diabetic patients with and without a history of foot ulceration. Furthermore the relationship between joint mobility and walking capacity was investigated. **Methods:** Passive joint mobility, walking capacity using a 2-minute walking test and barefoot plantar foot pressure using an EMED pressure platform was assessed in

15 diabetic patients with (DNU) and 27 without history of foot ulceration (DN). **Results:** Maximum weight bearing 1st metatarsophalangeal joint extension and maximum ankle dorsal flexion were decreased in DNU compared to DU (28 ± 13 vs 38 ± 13 degrees, $p < 0.05$ and 10 (6.7-12) vs 14 (10-18) degrees, $p = 0.05$ respectively). There was no significant difference in plantar foot pressure or walking capacity between the two groups. The pressure-time integral was associated with foot deformities ($r = 0.61$), BMI ($r = 0.43$), popliteal angle ($r = 0.40$) and 1st metatarsophalangeal joint extension ($r = -0.38$) ($p < 0.05$). Walking capacity was associated with maximum ankle dorsal flexion ($r = -0.38$) and subtalar range of motion ($r = -0.31$) ($p < 0.05$). **Conclusion:** Reduced range of motion was associated to increased plantar pressure and walking capacity, and may in this way contribute to plantar ulceration in the neuropathic foot. Treatment to improve range of motion might help to prevent plantar ulceration in patients with limited joint mobility and neuropathy.