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The Role of altered Windlass Mechanism in patients with diabetes and neuropathy with precedents of ulcer in the first metatarsal head García-Álvarez Y, Lázaro-Martínez JL, García-Morales E, Álvaro-Afonso FJ, Aragón-Sánchez J, Chana-Valero P. Diabetic Foot Unit. University Podiatry Clinic. Universidad Complutense de Madrid. Spain

Introduction: The limitation of the first metatarsophalangeal joint (MPJ) in patients with diabetes mellitus (DM) produces mechanical stress by collapsing the foot, making the gait unstable, and increasing the pressure on plantar surface. That is the reason why it has been considered as risk factor in the hallux ulceration, as well as other general factors, such as body mass index and the presence of pronated foot and diabetic neuropathy (DN). **Aims:** To analyze the relationship between the Windlass mechanism (WM) alteration and precedents of ulcer in the first MPJ on plantar surface. **Methods:** Observational retrospective study of 788 patients conducted between February 2007 and February 2009, which included subjects with and without diabetes mellitus who had no active ulcer at enrollment. Demographic variables and the general and specific history of diabetes mellitus were recorded. Patient's foot type according to the Foot Posture Index, joint mobility, WM, deformity and previous ulcer were recorded. **Results:** 41.24% (n=325) were non-diabetic patients, (29.57% (n=233) were patients with diabetes, without neuropathy, and 29.19% (n=230) patients suffered from diabetes and neuropathy. It was observed a higher limitation in foot joint motion ranges in patients with DM. More specifically, in patients with DM and DN, joint limited was more severely affected in inversion of the subtalar joint ($p<0.001$) and the first metatarsophalangeal joint when loaded ($p<0.05$). Also there was an increase in degrees of valgus in the neutral calcaneal stance position ($p <0.001$). Additionally, in all cases where precedents of ulcer in the first metatarsal head on plantar surface were found, the WM was altered ($p <0.001$), [OR (95% CI): 5.963 (2.671-13.309)]. **Conclusions:** There is a relationship between the alteration in the WM in patients with DM and precedents of ulcer in the first metatarsal head on plantar surface. The inclusion of the WM in the biomechanical protocol of these patients will allow to warn of the high risk of developing ulcers, and establish the appropriate secondary and tertiary prevention tasks, with the main objective of avoiding surgery at this level, which could trigger important biomechanical alterations with difficult treatment.