

Relationship between foot structure and duration of Diabetes Mellitus

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Introduction: It is thought that diabetes mellitus alters foot structure over time. For instance, acquired pes cavus has been reported in a patient with diabetes [1]. However, another study found no relationship between foot structure and diabetes [2]. Such confusion may relate to inaccurate measures of foot structure or differences related to duration of diabetes. We used the highly reliable and valid Foot Posture Index (FPI) to determine the relationship between foot structure and duration of diabetes mellitus. **Methods:** 35 participants (24 male, 11 female) aged 34 to 80 years (mean 67.6, SD 9.5 yrs) with diabetes mellitus (17% Type I, 83% Type II) volunteered to participate in this study. Both feet were assessed for foot structure using the FPI [3], whereby a total score ranging from -12 (highly cavoid) to +12 (highly planus) was calculated from the assessment of six clinical features of standing foot structure. Duration of diabetes was determined as years since diagnosis. **Results:** Foot structure ranged from a FPI score of -4 to +10 (mean 2.9, SD 3.1), which is slightly less pronated than the normal population (mean 5, SD 3) [3]. Duration of diabetes ranged from 1 to 61 years (mean 18.8, SD 14.5 years). A significant negative correlation was identified between foot structure and duration of diabetes ($r=-0.463$, $P<0.01$), indicating a more cavoid foot structure with advancing duration of diabetes. Foot structure was not related to age, gender, body mass or height ($r< 0.22$, $P>0.05$). **Conclusion:** Foot structure progresses toward a cavus alignment over time in people with diabetes. Pathogenesis is unclear, but may relate to progressive motor neuropathy or limited joint mobility. Given the known increases in plantar pressure and pain associated with pes cavus, targeted interventions are a priority.

- References: 1. Bhansali A, et al. Saudi Med J., 25(10); 1497-1498, 2004.
2. Ledoux WR, et al. J Rehabil Res Dev., 42(5); 665-672, 2005
3. Redmond AC, et al. Clin Biomech., 21 (1); 89-98, 2006.