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[Intrinsic foot muscle and plantar tissue changes in type 2 diabetes mellitus.](#)

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Abstract BACKGROUND: Diabetes mellitus is a metabolic disorder with involvement of the neurovascular and muscular system. Peripheral neuropathy (PN) is thought to be the principal cause of foot complications in type 2 diabetes mellitus (T2DM). However, foot evaluation using ultrasonography early in the course of diabetes has not gained due importance. The aim of the present study was to evaluate the thickness of intrinsic foot muscles, plantar skin, plantar fascia, and plantar fat pad in T2DM subjects with and without PN using musculoskeletal ultrasonography.

METHODS: This study was conducted in 30 T2DM subjects with and without PN and 30 age-matched non-diabetes mellitus (NDM) subjects. After detailed clinical evaluation, high-frequency musculoskeletal ultrasonography was used to measure the thickness of the intrinsic foot muscles and plantar tissue thickness under the metatarsals. Data were analyzed using independent t-tests to compare T2DM groups with NDM subjects, and one-way ANOVA followed by Tukey's honestly significant difference test for between- and within-group analyses.

RESULTS: There was a significant reduction in the thickness of the intrinsic foot muscles and plantar tissue in T2DM compared with NDM subjects ($P < 0.05$). However, there were differences in intrinsic foot muscle and plantar tissue thickness between T2DM subjects with and without PN.

CONCLUSION: There was a substantial decrease in intrinsic foot muscle and plantar tissue thickness in T2DM compared with NDM subjects, indicating that structural changes appear in the foot before PN develops. The techniques used in this study

cannot exclude the possibility that neuropathic changes that are clinically undetectable may develop in parallel with changes in plantar tissues.

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