

Musculoskeletal manifestations of diabetes mellitus: the role of exercise therapy in the treatment of limited joint mobility, muscle weakness and reduced gait speed

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It is well known that limited joint mobility of the ankle and foot, impaired muscular performance and reduced gait speed are risk factors for ulceration in diabetic foot. The aim of this study was to evaluate the effect of an experimental protocol of exercise therapy on joint mobility, muscular strength and gait speed in a group of long-term diabetic subjects. The protocol consisted of a 12-week supervised training program; both joint mobility and muscular strength at the ankle were measured before and after exercise therapy by an inclinometer and isometric dynamometers respectively, in 26 diabetic subjects and compared to 17 healthy controls.

Ankle joint mobility in plantar flexion was reduced about 36% and dorsal flexion by about 23% in diabetic subjects compared to controls ($p < 0.001$), but significantly increased after exercise therapy ($p < 0.001$ for both). Ankle muscular strength in plantar flexion was reduced by about 51% and in dorsal flexion by 30% in diabetic patients compared to controls, but these also significantly increased after exercise therapy ($p < 0.001$). Consequently, patients' walking speed increased after exercise therapy by 0.28 m/s ($p < 0.001$).

A 12-week supervised program of exercise therapy significantly improves joint mobility, muscular performance and walking speed in diabetic patients--thus limiting one of the pathogenic factors of diabetic foot and potentially preventing disability.

Keywords

Adapted physical activity; diabetic foot; exercise therapy; gait; joint mobility; muscle strength.