

The impact of diabetes mellitus and sport practice on joint mobility, muscle strength and posture of young subjects

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It is known that diabetic disease may modify patients' joint mobility, muscle strength and posture. The aim of this study was to evaluate the presence of differences between young patients with T1DM and young sports subjects. In 23 patients with diabetes (13/11:m/f), mean age 10.7±1.2 yrs, duration of diabetes 6.1±3.0 yrs, mean HbA1c 7.6±0.9 %, (group D), and in 52 healthy control subjects (39/14:m/f), mean age 11,1±1,5 yrs (group C) were evaluated muscle strength (standing long jump, hand grip, key pinch test), ankle joint mobility (AJM) (inclinometer), flexibility (sit and reach test), foot plantar pressure distribution in quiet standing and posture (baropodometric analysis, images). Group C was composed by 2 teams of soccer players: 23 soccer players (23/0:m:f), mean age 12,0±0,3 yrs (group SP1); 15 young soccer players (15/0:m:f), mean age 9,0±1,3 yrs (group SP2); and a team of 14 volleyball players (0:14/:m:f), mean age 11,8±0,3 yrs (group VP). The group D showed a significant reduction of AJM in plantar flexion compared to VP group (31.2 ±5.5 vs 41.0 ±5.6; p<0.001). The SP1 group showed a significant lower AJM compared to the VP group (122.5 ±30.0 vs 149.3 ±13.7; p<0.005), and the ankle plantar flexion (28.4 ±7.5 vs 41.0 ±5.6; p<0.001) was more reduced compared to the dorsal one (108.3 ±10.2 vs 94.1±23.7; p<0.05). Considering all subjects investigated AJM was directly correlated with flexibility (r=0.37; p<0.005). Only in the group D, AJM in plantar flexion and flexibility had not a significant correlation. The strength tests did not show differences between the groups age-matched. Strength exerted in the hand grip test and in the key pinch test were correlated (r=0.44; p<0.01). On the sagittal plane the inclination of the axes that arise from the center of the lateral malleolus and passing through the center of the head of the fibula or the tragus of the ear, was directly correlated in control groups (control: r=0.52, p<0.01). The inclination of the axis passing through lateral malleolus and head of the fibula was significantly correlated with the forefoot and rear-foot plantar pressure distribution (r=0.38; p<0.05). The results of this pilot study show that diabetes and playing soccer may negatively affect ankle mobility and the posture on the sagittal plane of young subjects. The confirmation of these results in larger studies might justify appropriate preventive interventions.

References

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Keywords

Diabetic foot, diabetes, limited joint mobility.