

Abstract

Title: The influence of the surface load distribution of the foot during dynamic movement in tennis

Objectives: The aim of this work is to determine whether there is a change in the force load in the area of the sole of the foot during the forehand strike phase in an open position depending on the type of playing surface.

Methods: The research was attended by 10 level I tennis players of ranging from the age of 17 to 28. Each of the players has played tennis for at least two years, train 2 – 3 times a week and has no limb injury in the past 12 months. Using the Pedar-X instrument, changes in the force of the plantar load during the forhend strike phase on clay and Casali surfaces were measured. To evaluate these changes, the contact forces [N] (vertical reaction forces) were measured. First, an intra-individual foot impact assessment on the heel region and forefoot on the clay and Casali surface were performed using graphs of temporal force averages. Secondly, an inter-individual evaluation of the maximum force values in the region of the heel, midfoot, forefoot, hallux and lesser toes and whole feet of the foot was performed using the paired t-test statistical method.

Results: The results of the work show that the different surfaces influence the size of the load as well as its plantar distribution during foot impact. From the evaluation of the time-lapse graphs, it can be seen that for 8 players the foot impact was made on clay on the forefoot. On the Casali surface, the foot impact made by all 10 players was on the heel region. There was a statistically significant difference in the heel region, hallux and lesser toes and whole feet with higher values for Casali compared to clay surface.

Keywords: forehand, Pedar-X, foot, tennis, vertical reaction force, load, injuries