

Abstract

Title: Evaluation of dynamic postural stability of basketball players

Objectives: The aim of this diploma thesis is to evaluate and compare the level of dynamic postural stability between basketball league players and healthy population, who don't do any regular physical activity, using dynamic computer posturography named NeuroCom Smart EquiTest System. Another aim of this study is to objectively assess differences in postural stability between males and females or depending on history of previous injury of ankle joint.

Methods: This quantitative observational cross-sectional study involved 64 probands between the ages of 19–29 years. The experimental group consisted of basketball players ($n_1 = 24$) and control group of non-athletes ($n_2 = 40$). Each group was divided into two halves of men and women. NeuroCom Smart EquiTest System was chosen for objective measure of dynamic postural stability, which was held at the Laboratory of applied kinesiology of Charles University, Faculty of Physical Education and Sport. Following five protocols were chosen from the test battery: *Sensory Organization Test*, *Motor Control Test*, *Limits of Stability*, *Adaptation Test* and *Unilateral Stance*. Then the measured data were processed by NeuroCom Balance Manager Software and for statistical analysis these statistical methods were used: Shapiro-Wilk test, Student's T-test, Mann-Whitney U test. Furthermore, the degree of clinical significance was characterized by Cohen's d .

Results: A statistically significant difference in favour of basketball players was found in the MVL parameter of Limits of Stability Test ($p = 0,046$) and also in the direction of Toes up ($p = 0,015$) and Toes Down ($p = 0,005$) of Adaptation Test. A statistically significant difference in favour of non-athletes was found in COND3 of Sensory Organization Test ($p = 0,046$), in directional control of Limits of Stability Test, where p -value was 0,007, in parameter SL of Motor Control Test ($p = 0,0001$) and also in the Unilateral Stance Test in the case of right lower limb ($p = 0,017$).

Keywords: Dynamic postural stability, NeuroCom Smart EquiTest, basketball, balance, posture, ankle sprain