

Abstract

Title: Postural stability in Ultimate frisbee players

Aims: The aim of the work is to objectively measure and evaluate the dynamic postural stability of a deliberately selected group of Czech Ultimate frisbee (UF) players and then compare the measured results with the "Athles Norm 20-30" (AN 20-30) standard, set for the sporting population. The postural stability of the research group of probands was measured once using the computer dynamic posturography - NeuroCom Smart EquiTest System. A partial goal of the work was to describe the results of measuring postural stability with respect to pivoting. This characteristic movement is used by UF players to obtain a suitable position for passing to a teammate during the game.

Methods: This is a scientific research work, specifically a quantitative observational cross-sectional study. The research group ($n = 28$) was, on the basis of predetermined criteria (to be an active UF player registered under the organization ČALD (Czech Flying Disc Association), age 18–35 years, to attend UF for at least 3 years and to have at least one national team start at the European Championships or in higher competition). UF players who met these criteria were included. Measurement on the Smart EquiTest System from NeuroCom was chosen as an objective way of evaluating postural stability. The measurement took place in the Laboratory of Applied Kinesiology, Charles University, FTVS. Each subject underwent the following seven test protocols: Sensory Organization Test, Motor Control Test, Limits of Stability, Adaptation Test, Rhythmic Weight Shift, Weight Bearing Squat, and Unilateral Stance. The measured data were first processed in the Neurocom Balance Manager Software program and then transferred to Microsoft Excel 2010, in which the following statistical models were used for statistical analysis: Shapiro-Wilk test of normality, Welch test and Student's T-test. To evaluate the results from the comparison of research group and AN 20-30, the level of statistical significance of the results $\alpha = 0.05$ was determined.

Results: Statistically significant differences in the measured values were found in the following test protocols: LOS, MCT, RWS and ADT. UF players were significantly more successful in the EPE, MXE, RT and MVL parameters of the LOS protocol and in both tested directions (LR and FB) of the RWS protocol. UF players achieved worse results than the AN 20-30 in the "toes down" parameter of the ADT protocol, in the „latency“ parameter of the MCT protocol and in the DCL parameter of

the LOS protocol. The difference between lower limbs was assessed for the MTC protocol parameters „amplitude“ and „latency“. However, the difference in these parameters between lower limbs was not confirmed. A tendency to different load of lower limbs in favor of left leg was observed, which occurred both when measuring the MCT test (WS) and when monitoring the position of COG within the individual conditions of the SOT.

Keywords: dynamic postural stability, NeruoCom Smart EquiTest System, Ultimate Frisbee, AN 20-30 (“Athles Norm 20-30”), posture