

ABSTRACT

Title: Ranges of joint mobility in the hip and ankle joints and evaluation of flat feet on a podoscope when finding hallux valgus in classical ballet dancers

Objectives: The aim of this thesis is to evaluate if selected parameters: passive range of motion (ROM) of rotations in hip joints, Q angle, passive range of motion of plantar flexion in ankle joints and the foot index are connected with the finding of hallux valgus (HV) diagnose. These factors will be compared between two groups of ballet dancers, one with HV and one without the HV diagnose.

Methods: This observational case control study involved 30 probands between the age of 20-40 years. The experimental group consisted of classical ballet dancers with the HV angle (HVA) $>15^\circ$ at least on one foot ($n_1 = 19$), in the control group were classical ballet dancers with the HVA $<15^\circ$ bilaterally ($n_2 = 11$). The HVA, ROM of the rotations in the hip joints, ROM of the plantar flexion in the ankle joints and Q angle were measured by a goniometer. The plantogram was captured by a photograph of the foot while standing on a podoscope and then it was evaluated by the Sztriter-Godunov method. Analysis of the data was done in R software by means of a Welch's Two-Sample t-Test and the correlation was given by Pearson's Correlation Coefficient.

Results: Contrary to the group without HV in the experimental group there were found statistically significant lower values of external rotation (ER) in the hip joint on the left lower extremity (LLE) ($p = 0,031$), higher values of internal rotation (IR) in the hip joint on the right lower extremity (RLE) ($p = 0,032$), higher values of plantar flexion (PF) bilaterally ($p = 0,043$ RLE; $p = 0,002$ LLE) and significantly lower difference between ER and IR in the hip joint bilaterally ($p = 0,014$ RLE; $p = 0,003$ LLE). There was also found statistically significant correlation between ER and HVA bilaterally ($r = -0,39$; $p = 0,033$ RLE; $r = -0,49$; $p = 0,006$ LLE) and IR and HVA on the right side ($r = 0,37$; $p = 0,047$) when higher ER correlated with higher HVA bilaterally and higher IR correlated with higher HVA on the right side. Statistically significant correlation was also found in the difference of rotations and HVA where lower difference correlated with higher HVA ($r = -0,5$; $p = 0,005$ RLE; $r = -0,47$; $p = 0,009$ LLE). Evaluation of Q angle and foot index didn't bring any statistically significant results.

Key words: hallux valgus, classical ballet dance, range of motion, Q angle, foot, flat foot