Abstract

Title: Neurophysiologic intervention induced changes of the functional foot characteristics in school children.

Objectives: The aim of the research was to identify the functional characteristics of the foot in school children selected on the basis of the activity of physical activity in the highest intensity (sporting children) and in the lowest intensity (non-sporting children) and to find out possibilities of influencing the functional characteristics of the foot by targeted neurophysiological intervention. The whole research study was divided into 3 related parts, which were examined separately. The first study aim was an identification of group specific functional characteristics of the foot in 2 groups of school children – actively sporting children and non-sporting children. The second study aim was the influence determination of long-term duration high performance sport activity on the functional characteristics of the school children foot in adolescent elite soccer players. And the aim of the third study was to verify the effect of the targeted neurophysiologic active intervention on the functional foot characteristics in actively sporting children with foot dysfunction of pronated foot and/or flatfoot type.

Methods: The research study was divided into three study parts consisted of cross-sectional study, longitudinal progressive observation, and quasi-experiment. Combination of clinical examination methods of the foot (Chippaux-Šmiřák index and Foot posture index) and laboratory instrumental methods of static pedobarography (total travelled way of COP displacement) and dynamic pedobarography (Centre of pressure excursion index) was used.

Results: Both groups of school children - sporting children and non-sporting children, presented a high incidence of foot disorders, while non-sporting children had worse results than sporting children. Results proved a negative effect of the long-term high-performance sport activity on the foot morphology and function of sporting children in adolescence, which was manifested by the occurence of new foot disorders during the under review period and the worsening of already presented foot disorders. Targeted neourophysiologic intervention had a demonstrable positive therapeutic effect on the pronated foot and flatfoot disorders in actively sporting children.

Keywords: Foot typology, foot dysfunction, children´s gait, Foot posture index, Chippaux-Smirak index, COP displacement, COP trajectory, Gait line index, Centre of pressure excursion index, sport activity, physical inactivity, soccer