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ASYMMETRY INDICES IN FEMALE RUNNERS AS PREDICTORS OF RUNNING VELOCITY

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Abstract

Introduction. This paper aimed to establish relationships between the level of functional and dynamic asymmetry in advanced and intermediate-level runners and running velocity. Furthermore, evaluation of dynamic symmetry (running and vertical jump) was made using indices, taking into account the continuous character of the signals of the ground reaction force and angular positions in individual joints of the lower limb. **Material and methods.** Symmetry was assessed in a group of 12 Polish elite female middle-distance runners for the following parameters: 1) strength of lower limb muscles, 2) impulse of the vertical component of the ground reaction force during a CMJ jump, and 3) kinematics of a 50-m run in a straight line. **Results.** More advanced athletes (group A) were significantly taller and stronger than the athletes with less training experience (B). They were also characterized by a significantly longer step, a more extended swing phase, and a shorter support phase. There were no statistically significant differences between groups A and B in the level of asymmetry. Running velocity was significantly influenced by muscle strength symmetry ($b = -5.77$; $p < 0.01$) and support phase time symmetry ($b = -6.64$; $p < 0.03$). A reduction in each of these indices leads to an increase in running velocity. **Conclusion.** No morphological or functional asymmetry was found in female middle-distance runners with different training experience.

Key words: running symmetry, running velocity, muscle force, CMJ jump