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Differences in morphological and biodynamic characteristics in maximum speed and acceleration between two groups of female sprinters

M Čoh, K Tomažin, N Rausavljević

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The purpose of the study was to identify those morphological characteristics and biomotor parameters that differentiate between trained female sprinters in terms of 100-m sprint results. Morphological characteristics were established with a set of 21 variables measured with the International Biological Programme (IBP) procedure. Biodynamic parameters of sprint running were identified on the basis of the start acceleration test and the maximum speed test. The criterion for start acceleration was a 30-m run from the sprint start and the criterion for maximum speed was a 30-m run from a flying start. In these two tests measurements were carried out using the Opto-Track system. Statistically significant differences between the two groups of female sprinters were established by the t-test for independent sample. The results of the study showed that the athletes did not differ in terms of morphological characteristics, with the exception of leg length ($p < 0.05$). The differences between the athletes were statistically significant in the start acceleration speed and the maximum speed ($p < 0.01$). In both tests, the most important generator that differentiated between the superior and the inferior sprinters was the stride length ($p < 0.01$). The contact phase time was on the edge of statistical significance only in the case of start acceleration. Superior sprinters develop higher starting speed ($p < 0.05$), due to shorter average contact time, longer stride ($p < 0.05$) and the same frequency compared to the inferior group.

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