

RELATIONSHIP BETWEEN VERTICAL JUMPS AND STARTING ACCELERATION IN SPRINT

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INTRODUCTION: The purpose of this study was to relate standardized vertical jumps with acceleration phase in sprint. Since vertical jumps employ typical kinetic chains and provide insight into basic movement strategies of the athlete, they may provide additional information about the nature of sprint acceleration phase.

METHOD: Sixteen male Slovenian sprinters (age 23,8 + 4,1 years, height 180,6 + 5,6 cm, body mass 78,2 + 9,0 kg) volunteered in the study. Subjects performed maximum sprints to 30 m from a block start and time to 5, 10, 15, 20 and 30 m were recorded by electronic timing gates. Stride length, stride frequency, contact and flight times for the first 25 meters were measured by OptoJump (Matsport, Saint Ismier, France). Afterwards, three squat jumps (SJ) were performed on a force platform. The best attempt (fastest run and highest jump) was used for further analysis. Mean contact times for the first four strides (Tcon1, second four strides (Tcon2) and the last two strides (Tcon3) were calculated. Same was done for flight times, stride frequency (SF) and stride length (SL). SJ parameters included jumping height and mean accelerations during the first (ACC1) and the second half (ACC2) of the push-off phase.

RESULTS: Results are shown in Table 1 and Figure 1.

Table1 Correlation between sprint times and SJ

	Height	ACC2
T5	0,035	0,007
T10	0,016	0,000
T15	0,018	0,000
T20	0,008	0,000
T30	0,018	0,000

Cells contain statistical significance of Pearson correlation coefficients.

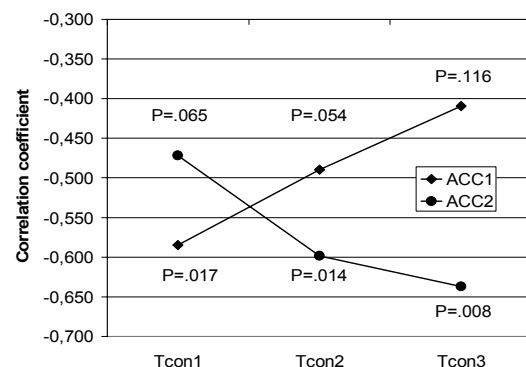


Figure 1 Correlation coefficient between contact times and mean SJ accelerations in the first and second half of SJ push-off.

DISCUSSION: ACC2 correlation to sprint time increased with the distance covered noting that distal part of kinetic chain employed in SJ was important during the whole acceleration phase of sprinting. When observing contributions to the contact times, in the first four steps proximal muscles were more important while later distal muscles took over.

CONCLUSION: Pushing strategy related to distal part of trunk-leg extensors kinetic chain seemed to dominate the sprint acceleration phase.

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