EFFECTS OF DIFFERENT RESISTED SPRINT RUNNING METHODS ON STRIDE LENGTH, STRIDE FREQUENCY, AND CG VERTICAL OSCILLATION

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INTRODUCTION: Sprint velocity can be increased thanks to specific strength improvements (Korchemny, 1985). The training principle of specificity states that for a training session to be effective, it must maintain similar characteristics to the sport requirements (Sale, 2003). With the use of resisted sprint running methods, possible benefits are specific strength improvements and an increase in stride length (Faccioni, 1994). However, these methods have not been scientifically proven yet (Sheppard, 2004).

METHOD: The aim was to determine the effects produced by the use of sled towing with 16% body weight (BW), speed-chute, weighted belt with 9% BW, shod and barefoot sand sprinting on stride length, stride frequency, and CG vertical oscillation (CGvo) in maximal velocity phase in sprinting. Ten sub-elite sprinters (5 male and 5 female) randomly performed 30 m maximal-effort fly sprinting with and without load. A 2D photogrammetric study was carried out, and a video camera was used operating at 50 Hz. The digitised coordinates (22 points model) were interpolated applying 5th order splines to 100 Hz. Wilcoxon for dependent samples was conducted comparing unloaded with each resisted method (α=0.05).

Table 1. Comparison of unloaded vs 5 resisted methods. Mean±standard deviations are presented. *Significantly different from unloaded sprint running, *P*<0.05.

RESULTS: Table 1 shows data resulting from sprint resisted methods.

Variable		Unloaded	Sled 16% BW	Parachute	Belt 9% BW	Sand shod	Sand baref.
Stride length (cm)	M	210.2±7.5	197.4±7.4*	200.8±10.4*	204.4±3.4	183.7±7.3*	182.9±4.2*
	F	185.6±7.5	169.4±12.7*	184.5±9.1	184.4±8.5	165.3±8.3*	162.6±10.7*
Stride freq. (Hz)	M	4.7±0.2	4.3±0.3	4.7±0.3	4.4±0.5	4.3±0.2	4.6±0.4
	F	4.2±0.2	4.1±0.5	4.1±0.2	4.2±0.2	3.9±0.4	4.1±0.2
CGvo (cm)	M	5.8±1.5	4.8±0.8	5.9±1.6	4.9±0.6	8.0±0.9*	8.0±1.0
	F	6.4±0.9	7.7±1.1*	7.2±0.5	7.4±1.0*	7.7±1.7	7.7±1.7

DISCUSSION: Data show that belt and parachute are the methods that lest modify the running technique, possibility due to differences in the internal load. Parachute resistance varies with speed, and it manifested greater decreases in males' stride length. Shod and barefoot sand running showed very similar changes. Further, studies should analyse the effects on other biomechanical variables such as angular joint amplitudes and velocities.

CONCLUSION: Each resisted method shows different effects in the studied variables in males and females. Depending on the training necessities and the gender, different methods should be used.

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