Effect of Depth Jumps and Back Squats on Eliciting Postactivation Potentiation for a 40-meter Sprint

Landrigan, J., Swensen, T., Kaye, M. Exercise and Sport Sciences, Ithaca College, Ithaca NY.

PURPOSE: Data show that heavy preload stimuli preceding a sprint can improve performance by eliciting postactivation potentiation (PAP), an increased intramuscular sensitivity to calcium that enhances cross-bridge cycling, thereby acutely enhancing force production and strength. The aim of this study was to compare depth jumps (DJ) to back squats (S) as a means to elicit PAP in college aged female rowers. **METHODS:** Twenty Division III collegiate female athletes, whose $X \pm SD$ for age, height, weight, and VO_2 Max were, respectively, 18.9 ± 0.9y, 1.5 ± 0.05m, 60.7 ± 21.4kg and 42.8 ± 4.4ml.kg^{-1}.min^{-1}, completed a 40 m sprint timed at 10 m, 20 m, and 40 m with a timing system. Subjects were randomly divided into either the DJ or S group. Subsequently, their one repetition maximum (1 RM) for the BS or DJ was measured. One week later, subjects completed a 40m sprint, and then three repetitions at 90% of their 1RM for BS or DJ; after 7 min of active rest, they completed another 40m sprint. A dynamic warm-up and active cool down preceded and followed each testing session. Data were analyzed with three 2x2 repeated measures ANOVA. **RESULTS:** Both conditions significantly increased sprint time at 40m; BS 20m sprint time was also slower. **CONCLUSION:** The data show that three repetitions at 90% of 1RM for BS or DJ did not elicit PAP in female college rowers. These findings may be related to sex, load, training incompatibility, or sprinting proficiency in this subject population.

Mean Sprint Times (s) by Group

	Depth Jump (n=10)			Squat (n= 10)		
	10m	20m	40m	10m	20m	40m
Pre	2.06 ± 0.09	3.62 ± 0.12	6.55 ± 0.27	2.10 ± 0.09	3.62 ± 0.14	6.61 ± 0.32
Post	2.09 ± 0.11	3.68 ± 0.13	6.66 ± 0.27*	2.10 ± 0.09	3.66 ± 0.17*	6.67 ± 0.36*

Note. * $p < 0.05$