

Background

Neuromuscular priming is a popular strategy among practitioners to elicit a temporary increase in physical characteristics, like strength, power, speed, and coordination, that are beneficial for success in competitive events. The sport of baseball relies heavily on the ability to express these characteristics, and acute improvements can mean the difference between winning and losing. Same-day priming has been studied extensively in the current body of literature. However, investigation into delayed potentiation (greater than 24 hours) remained unclear, with even fewer studies examining variations of the same priming stimulus.

Purpose

To examine the effect of two hex bar deadlift variations on select performance and subjective measures,

Methods

Nineteen (n=19) male NCAA Division I baseball athletes participated in a counterbalanced, repeated-measures study to examine the effectiveness of two variations of hex bar deadlifts (concentric-only and traditional) as additions to a priming protocol. Jump, throw, and sprint testing, along with subjective visual analog scales for fatigue and soreness, were collected before and 24 hours after each priming protocol. Post-protocol RPE was collected immediately following each protocol. Separate two-way repeated measures ANOVAs were performed to investigate differences between time and protocol for all performance measures and the visual analog scales. RPE differences were examined using paired-samples t-tests. Statistical significance was set a priori at p<0.01 to account for the number of tests performed. Smallest worthwhile changes were calculated for all performance measures (SWC=0.2xSD).

Results

No significant interactions for time and protocol or main effects for protocol existed for any of the measures (p>0.01). A significant main effect for time was present in the 9MS (F(1,18)=10.766, p=0.004, n²=0.374, -0.025s) and VAS-F (F(1,18)=12.892, p=0.002, n²=0.417, +7.434 mm), but not for the CMJ, MBT, 27MD, or VAS-S (p>0.01). RPE showed no significant differences between protocols (p=0.95).

When same-day priming is not possible, both concentric-only and traditional hex bar deadlifts may be effective priming stimuli for improving short-distance, acceleration-focused sprint performance.

Practical Applications

This study's observations provide valuable insights for strength and conditioning coaches seeking effective delayed priming strategies (≥24 hours). For athletes with similar characteristics to this study, both hex bar variations were shown to enhance short-distance, acceleration-dominant sprint performance up to 24 hours post-priming. While there were increases in perceptions of fatigue and soreness following both protocols, all performance measures showed a majority of positive responses. These results suggest practitioners can confidently include either variation into a priming protocol the day before competition without negatively impacting their athletes' performance. Both protocols are practical and can be replicated in any facility with the necessary tools, making either the concentric-only or traditional variation appealing for scenarios where same-day priming may not be feasible (i.e., traveling for a competition).

Table 1. Results from 2x2 ANOVA and Post Hoc T-Tests for Performance Measures

Measure	Protocol	Pre-Priming Mean ± SD	Post-Priming Mean ± SD	P value (n ²)		
				Main Effect		
				Time	Protocol	Interaction
CMJ	CHBDL	87.00 ± 7.45	87.23 ± 6.60	0.374 (0.044)	0.811 (0.003)	0.588 (0.017)
	THBDL	86.56 ± 5.84	87.34 ± 6.42			
MBT	CHBDL	50.73 ± 2.70	51.33 ± 2.98	0.061 (0.182)	0.393 (0.041)	0.408 (0.038)
	THBDL	50.06 ± 2.83	51.15 ± 2.49			
9MS	CHBDL	1.57 ± 0.06	1.54 ± 0.07	0.004* (0.374)	0.059 (0.184)	0.491 (0.027)
	THBDL	1.58 ± 0.06	1.56 ± 0.06			
27MD	CHBDL	3.78 ± 0.14	3.74 ± 0.11	0.012 (0.301)	0.054 (0.192)	0.887 (0.001)
	THBDL	3.80 ± 0.15	3.78 ± 0.11			

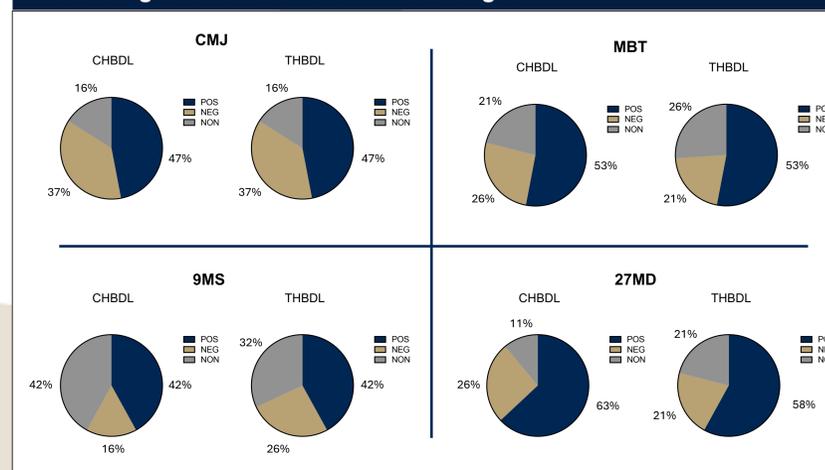
* Indicates statistical significance p < 0.01

Table 2. Results from 2x2 RM ANOVA and Post Hoc T-Tests for Perceived Measures

Measure	Protocol	Pre-Priming Mean ± SD	Post-Priming Mean ± SD	P value (n ²)		
				Main Effect		
				Time	Protocol	Interaction
Fatigue	CHBDL	17.32 ± 14.91	25.50 ± 16.30	0.002* (0.417)	0.447 (0.033)	0.783 (0.004)
	THBDL	19.63 ± 14.38	26.32 ± 22.10			
Soreness	CHBDL	26.03 ± 21.07	37.03 ± 24.42	0.012 (0.303)	0.347 (0.049)	0.730 (0.007)
	THBDL	31.71 ± 25.19	39.26 ± 29.69			

* Indicates statistical significance p < 0.01

Figure 1. Percentage of Positive, Negative, and Non-Responders According to Smallest Worthwhile Changes



Conclusion

Both hex bar variations serve as effective priming strategies for improving short-distance, acceleration-focused sprint performance up to 24 hours post-priming. Regardless of the observed increase in fatigue following the protocols, all examined performance measures, in terms of the smallest worthwhile change, elicited more positive responses than negative ones. Furthermore, neither protocol was observed to result in a more profound feeling of exertion, as indicated by RPE.