

Comparison of Electromyographic Responses Across Handle Types During Seated Row Exercise

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Handle design and wrist position can affect the muscular performance during resistance exercises. **Purpose:** This study compared the electromyographic (EMG) responses during seated row exercise in the Latissimus Dorsi (LD), Biceps Brachii (BB), and Flexor Carpi Radialis (FCR) using a cylindrical handle versus a wrist flexed gripping (WFG) handle, which puts the wrists in a semi-flexed position during exercise. **Methods:** Ten college-aged males with prior resistance training experience (6.3 ± 1.9 years) performed the exercise protocol on a cable machine. Participants completed a one-repetition maximal lift (1-RM) followed by one set at 85% 1-RM until failure using both handle types in randomized order. Root mean square EMG (EMG_{RMS}) recordings from the BB, LD, and FCR were normalized to the 1-RM values. **Results:** Two-way repeated measures ANOVA was used to analyze differences between handle types. EMG_{RMS} values (%) are presented in the table below:

* Sign. Diff. ($p < 0.001$)

	Handle Type	
	Cylinder	MAG®
Biceps Brachii	66.6 ± 8.9	$72.9 \pm 2.6^*$
Latissimus Dorsi	86.6 ± 13.3	84.2 ± 4.6
Flexor Carpi Radialis	57.9 ± 4.1	67.3 ± 4.3

The 1-RM lifts were significantly greater ($p < 0.003$) using the WFG handle (115.2 ± 17.4 kg) versus the cylindrical handle (112.5 ± 17.6 kg). However, there were no significant differences ($p > 0.43$) between handles for the total number of repetitions completed (cylindrical 11.9 ± 3.67 ; WFG 11.2 ± 2.4). **Conclusions:** These findings showed significantly higher maximal lifts and greater EMG activity in the BB using the WFG handle. Possible mechanisms for these differences may be related to actin and myosin overlap of the forearm flexors, grip comfort and differences in handle contact surface area.