**27. SWACSM Abstract**

**Electromyographic Examination of Hip and Knee Extension Hex Bar Exercises Varied by Starting Knee and Torso Angles**

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**ABSTRACT**

Variations of the deadlift can be executed using the hexagonal (hex) bar by altering, for instance, the knee and torso angles while maintaining a constant hip angle at the start position. **PURPOSE:** To examine muscle activation patterns of the biceps femoris, rectus femoris, and erector spinae during three deadlift variations using the hex bar.

**METHODS:** Twenty resistance-trained male and female subjects performed hex bar deadlift variations in three different starting knee flexion positions: 128.4 ± 8.5° (elevated Romanian Deadlift), 111.9 ± 8.7° (conventional elevated deadlift), and 98.3 ± 6.5° (conventional hexagonal bar deadlift). Subjects performed three repetitions at 75% of their three-repetition maximum. Electromyography sensors were placed on the dominant biceps femoris, rectus femoris, and lumbar erector spinae. A one-way repeated measures ANOVA was used to detect differences in mean and peak EMG values normalized to maximum voluntary isometric contraction (MVIC) (p<0.05).

**RESULTS:** As knee flexion increased at the starting position, mean activation of the rectus femoris increased (24.7±21.5 → 35.5±25.4 → 62.1±31.3% MVIC, p<0.001), while biceps femoris (40.6±17.9 → 34.0±16.4 → 28.1±14.5% MVIC, p=0.003) and erector spinae (73.0±27.6 → 65.9±34.4 → 54.9±32.5% MVIC, p=0.009) activation decreased. Peak activation of the rectus femoris increased (46.9±33.0 → 60.9±38.7 → 99.3±41.6% MVIC, p<0.001) while decreasing in the erector spinae (118.6±47.1 → 105.9±49.4 → 89.1±40.1% MVIC, p=0.008). The rectus femoris experienced the greatest mean differences of the three muscles. **CONCLUSIONS:** Practitioners should consider the muscular goals when adjusting the starting position of a hex bar deadlift as posterior chain recruitment diminished and quadriceps activation increased as knee flexion increased.