COMPARISON OF CORE MUSCLE ACTIVITY BETWEEN BACK SQUAT AND PUSH PRESS

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Background

- Previous research has been done exhibiting the fact that core strengthening leads to performance enhancement, postural improvement, and decreased risk of low back pain (1).
  - There are a wide variety of exercises that aim to provide such training.
- Previous studies have looked at the activation of core trunk muscles while performing sit-ups using different abdominal devices (2).
- To date, no known studies have looked at the activation of core trunk muscles compared between the back squat and push press, two traditional weightlifting movements.

Purpose

- The purpose of this study was to determine if there is a difference in muscle activation when performing a push press versus a back squat.

Methods

- Male varsity athletes (n=10) who regularly trained with Olympic barbell performed seven to ten repetitions of a push press and a back squat set to a metronome at 50 cycles per minute for each repetition.
- Electrodes were placed on the Rectus Abdominis(RA), Erector Spinae(ES), and External Obliques(EO) muscles in order to monitor muscle activity through electromyography (EMG) with wireless transmitters (3).
- Subjects performed seven to ten repetitions of push press and back squat with the Olympic Barbell and in a randomize order at 30 % of their 1RM.
- After finishing, subjects performed a max voluntary contraction (MVC) of a squat.
- The squat and Push press lifts were normalized to the MVC voltage. Data were analyzed using paired T-test.

Results

- The results presented in the following table are expressed means +/- standard deviations as a percent of MVC.

	RA	ES	EO
Squat	110.37±20.13*	61.22±5.1	51.55±6.13
Push Press	56.32±52.41*	73.07±23.83	45.73±39.93

- Significant differences were observed for RA tested relative to %MVC for each when comparing the Squat to PP. *denotes significance at $p < 0.014$

Conclusion

- The results of this study suggest that muscle activity in the muscle group Rectus Abdominis may be greater when performing a Squat vs. PP.

Future and Current Studies

- Comparison of Muscle Activity Between the Tsunami Barbell and an Olympic Barbell
- Comparison of Core Muscle Activity between Tsunami Barbell and Olympic Barbell for Squat and Push Press

References

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