

# COMPARISON OF PUSH PRESS MUSCLE ACTIVITY BETWEEN OLYMPIC AND FLEXIBLE BARBELL

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## I. Background:

- Previous research has compared the use of a flexible barbell and an Olympic barbell in the bench press movement.
- In these studies, flexible barbells were shown to produce more muscle activity than Olympic barbells.
- To date, no studies have looked at the difference in muscle activity between an Olympic and flexible barbell for the push press movement.

## II. Purpose:

- The purpose of this study was to determine if there is a difference in muscle activation when performing a push press using a flexible barbell versus an Olympic barbell.

## III. Methods

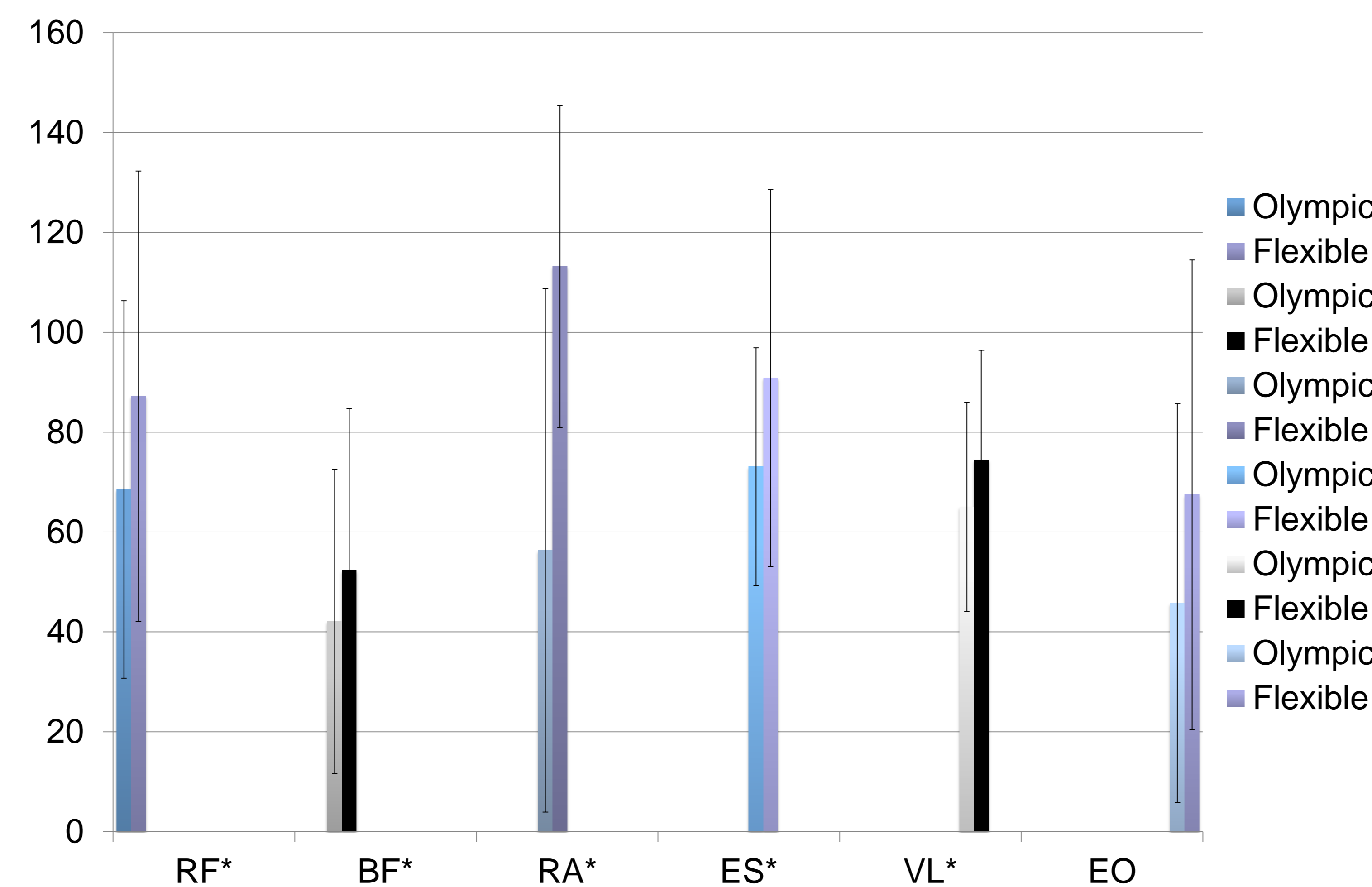
- Male varsity athletes (n=10) who regularly trained with both Olympic and flexible barbells volunteered for participation.
- Electrodes were placed on the Vastus Lateralis (VL), Biceps Femoris (BF), Rectus Femoris (RF), Rectus Abdominis (RA), Erector Spinae (ES), and External Oblique (EO) muscles in order to monitor muscle activity through electromyography (EMG) with wireless transmitters (Hermens).
- Subjects performed 7 to 10 repetitions of a push press with an Olympic and flexible barbell in randomized order at 30% of their 1RM.
- Repetitions were performed at 50 cycles per minute for each trial.
- Following these sets, subjects performed a max voluntary contraction (MVC) of a squat using the Olympic Barbell.
- The push press lifts were normalized to the MVC voltage.
- Data were analyzed using paired T-test.

## IV. Results

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

Barbell	RF*	BF*	RA*	ES*	VL*	EO
Olympic	68.53±37.8	42.11±30.45	56.32±52.41	73.07±23.83	65.03±20.97	45.73±39.93
Flexible	87.20±45.1	52.36±32.24	113.16±92.74	90.82±37.72	74.50±21.94	67.46±47.05

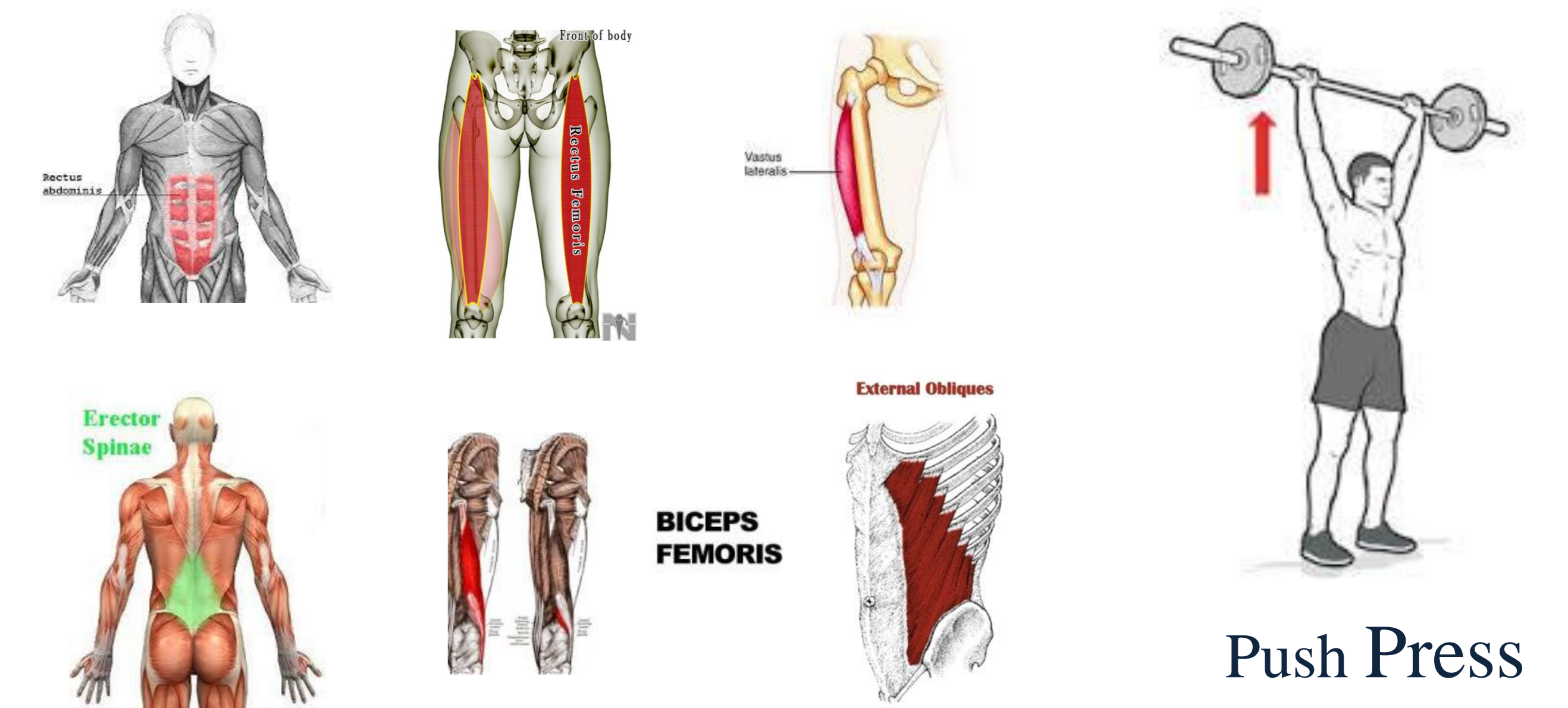
- Significant differences were observed for RF, BF, RA, ES and VL tested relative to %MVC for each when comparing the Olympic and flexible barbells. \*denotes significance at  $p < 0.03$  level



Graph 1 (above) shows the means of the Olympic barbell and flexible barbell muscle activation as a percent of MVC.

## Conclusion

- The results of this study strongly suggest that the flexible nature of the flexible barbell allows for greater muscle activation than the OB with respect to the RF, BF, RA, ES, and VL muscles in the push press movement.



## IV. FUTURE & CURRENT STUDIES

- Comparison of Muscle Activity Between the Tsunami Barbell and an Olympic Barbell In Squat Movement

## V. REFERENCES

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