



Impact of the Sling Shot on Bench Press Performance and Shoulder Girdle Muscle Activation



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Abstract

The Sling Shot, an instrument used during the bench press, is thought to improve performance, reduce upper limb pain, and promote proper technique. The purpose of this study was to determine the impact of the Sling Shot on upper body muscle activity and one repetition maximum (1RM) bench press performance. The hypothesis stated that if the Sling Shot decreases shoulder torque, then 1RM bench press performance should increase and upper body muscle activity should decrease while using the Sling Shot. Eight college-aged males participated in this study. Each participant's 1RM was tested with and without the Sling Shot. The bench press 1RM significantly increased an average of 29.38 ± 8.21 lbs. ($p=0.00009$) while wearing the Sling Shot. Muscle activation of the pectoralis major, anterior deltoid, and triceps brachii were measured using surface electromyography (sEMG) on each participant during the bench press under three conditions; 80% of 1RM without the Sling Shot, 80% of 1RM wearing the Sling Shot, and 80% of Sling Shot 1RM wearing the Sling Shot. A 2-way ANOVA revealed a significant difference in muscle activity in the pectoralis major and anterior deltoid, but not in the triceps brachii. Anterior deltoid muscle activity increased from condition 1 to condition 3 ($p=0.03$) and from condition 2 to condition 3 ($p=0.006$). Pectoralis major muscle activity decreased from condition 1 to condition 2 ($p=0.009$) and increased from condition 2 to condition 3 ($p=0.01$).

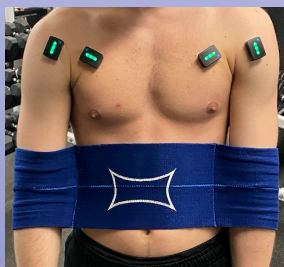
Introduction

Ergogenic aids have been used in various types of resistance training.¹ Specifically for the bench press, ergogenic aids such as caffeine and creatine have been used to increase performance.^{2,3} Physical devices to improve bench press performance include elastic bands and metal chains, and in more recent years a device was patented and sold to the public called the Sling Shot. The Sling Shot is an apparatus worn during the bench press to increase bench press performance, promote proper bench press technique, and decrease pain.⁴

Figure 1
Bench press attempt with sEMG electrodes and Sling Shot



Figure 2
sEMG electrode placement while wearing Sling Shot



Methods

Setting

- Small DI Midwestern University weight room; Spring 2020

Participants

- 8 college-aged males with at least 6 months bench press experience

Procedures

A 10-minute warmup was conducted before any testing

Day One

- Age and weight recorded
- Bench press demonstration
- 1RM assessed

Day Two

- 1RM assessed while wearing Sling Shot

Day Three

- Participants were fitted with sEMG electrodes
- Participants completed the following bench press sets:
 - Three MVICs
 - 1x3 at 80% 1RM (Condition 1)
 - 1x3 at 80% 1RM wearing the Sling Shot (SS) (Condition 2)
 - 1x3 at 80% SS 1RM wearing the Sling Shot (Condition 3)

Five minutes of rest given after MVICs. Two to four minutes of rest given between bench press sets. A metronome was set at 44 beats/min to control bench press rate.

Results

Figure 3
Results: 1RM bench press

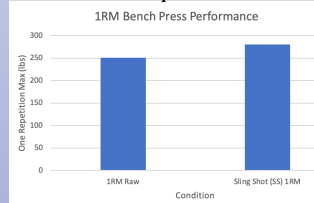
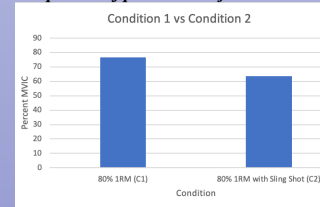


Figure 4
Comparison of pectoralis major C1 vs C2



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Results cont.

Figure 5
Comparison of pectoralis major C2 vs C3

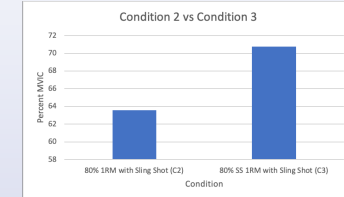


Figure 6
Comparison of anterior deltoid C1 vs C3

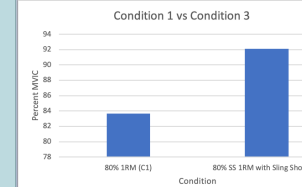
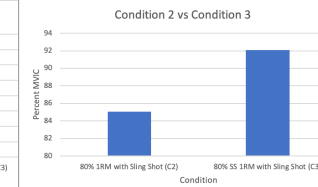


Figure 7
Comparison of anterior deltoid C2 vs C3



This study found the Sling Shot to increase bench press 1RM an average of 30 lbs ($p=0.00009$). A statistically significant difference was found between activation of anterior deltoid and pectoralis major with and without the Sling Shot, but no significance was found for triceps. Pectoralis major muscle activity decreased from condition 1 (without SS) to condition 2 (with SS) ($p=0.009$), but increased from condition 2 to condition 3 (SS 1RM with SS) ($p=0.01$). Anterior deltoid muscle activity increased from condition 2 to condition 3 ($p=0.006$) and from condition 1 to condition 3 ($p=0.03$).

Conclusions

The hypothesis for this study is partially supported, so we reject the null hypothesis for 1RM bench press performance, pectoralis major, and anterior deltoid. In an absolute comparison, muscle activity of the pectoralis major decreased from condition one to condition two. In a relative comparison, muscle activity of the pectoralis major increased from condition two to condition three. Muscle activity of the anterior deltoid increased from condition one to condition three and from condition two to condition three. These results indicate the Sling Shot may be used to increase work volume of the bench press by lifting more weight with increased muscle activity in the anterior deltoid, or used to decrease recruitment of the pectoralis major perhaps in rehabilitative cases. Future research could examine differences in muscle activity with higher repetition sets and varying resistance.

References

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