The Ability of A Warmup Using a Flexible Bar to Increase Countermovement Jump

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I. INTRODUCTION

Preparation of athletes to begin a competition or enter mid-competition with the ability to reach peak performance immediately may be partly dependent on the efficacy of the warmup protocol. Previous research on flexible barbells reports significant differences in muscle activation when compared to steel barbells. The manufacturers of handheld flexible bars with a combined weight of 3.63 kg claim that using them immediately before competition helps increase power and jump height

II. PURPOSE

The purpose of the study was to compare the effects of maximal jumping with handheld flexible bars with similarly-weighted dumbbells or no weight on jump parameters in Division-I collegiate football players.

III. SUBJECTS

Thirteen healthy NCAA division 1 football players volunteered for the study.

IV. METHODS

Each participant did 5 submaximal and 5 maximal jumps with either the handheld flexible barbell, similarly weighted dumbbells, or nothing performed in a random order, after which jump variables as measured by portable force plates and EMG activity during a maximal jump were compared among the three conditions. The subjects rested a minimum of 3 minutes between high powered warmup (HPW) protocols.

V. DATA

HPW protocol	Jump height (m)	Avg. Relative Propulsive Force (% BW)	Peak Relative Propulsive Force (% BW)	Time to Takeoff (s)
CON	0.444 ± .036	237.04 ± 20.7	299.69 ± 32.1	0.670 ± .079
DB	0.443 ± .032	236.74 ± 24.3	300.85 ± 36.9	0.679 ± .070
FB	0.448 ± .029	238.69 ± 22.1	304.98 ± 36.6	0.694 ± .093

Table 1: Comparison of selected maximal jump characteristics following three different HPW protocols. Values expressed as mean ± SD

VI. RESULTS

When comparing the effects of different HPW protocols, there were no differences in any jump parameters (Table 1). There was an increase in peak relative propulsive force (% BW) when ordering the jumps chronologically regardless of HPW protocol (Baseline Jump: 292.98 +/- 35.0, Jump 1: 301.78 +/- 39.8*, Jump 2: 303.11+/- 30.6*, and Jump 3: 301.34 +/- 35.1*, *$p \leq 0.05$, d=0.17). No differences in EMG activity of leg muscles was seen between HPW protocols.

VI. CONCLUSION

There is no difference between the effects of HPW protocols on jump characteristics and no difference in muscle activity between the handheld flexible bar and dumbbells. However, there does seem to be an effect on the propulsive force, regardless of the kind of weight used, evidence of a possible post-activation performance enhancement from maximal jumping.

VII. DISCUSSION

It could be possible that a lack of an effect could be that the amount of weight used was not significant enough, and any increase in ground reaction force due to the momentum generated by the flexible bar would not be significant. However, for practical application, this data suggest that coaches could use maximal jumping with their athletes whether it be with a handheld flexible bar or similarly weighted dumbbells and get the same, albeit small, changes in performance.

VIII. REFERENCES

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