TACSM Abstract

Comparison of Two Back-Squat Training Protocols

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ABSTRACT

Introduction. Eccentric Overload Training (EOT) and Conventional Training (CT) both contain eccentric components, however EOT utilizes more weight on the bar than the lifter can use during concentric contractions. Previous studies have suggested that EOT may produce benefits beyond what is observed for CT. Therefore, the purpose of this study was to compare the results of two different methods of strength training on one-repetition maximum (1-RM) back-squat (BkSq) and Hang Clean (HCl).

Methods and Procedures. Ten collegiate male cheerleader athletes volunteered to participate in the study and performed 1-RM max back-squat prior to and following 13 weeks of training. Four subjects trained using EOT while 5 others, matched for age and 1-RM BkSq ($p>.05$), trained three days per week conventionally on the BkSq as well as the front squat, press, bench, snatch, and clean and jerk. Criterion measures obtained on the pre-test BkSq and Hang Clean (HCl) were similar ($p>.05$) for the two groups.

Table 1. Description of subject volunteers for EOT (n=4) and CT (n=5).

	Age (yrs)	Ht (m)	Wt (kg)	BMI ($kg \cdot m^{-2}$)
EOT	22.0 ± 2.6	1.8 ± .05	91.4 ± 10.0	29.6 ± 2.6
CT	23.4 ± 2.3	1.9 ± .02	97.7 ± 15.2	30.0 ± 5.1

Results. Both groups increased in strength on the BkSq an average of 12.9 ± 8.9 kg and the HCl an average of 17 ± 13.6 kg. Repeated measures ANOVA revealed that both the EOT and CT groups demonstrated 1) significant pre-post grains in both the BkSq ($F(1,7)=12.6$, $p=.009$) and the HCl ($F(1,7)=15.3$, $p=.006$), and 2) no group interaction for BkSq ($F(1,7)=0.03$, $p>.05$) or HCl ($F(1,7)=1.96$, $p>.05$).

	Pre-BkSq (kg)	Post-BkSq (kg)	Pre-HCl (kg)	Post-HCl (kg)
EOT	163 ± 29.5	176 ± 25.3	109 ± 4.6	119 ± 10.3
CT	170 ± 30.3	182 ± 18.6	87 ± 23.9	110 ± 15.0

Table 2. Pre- and posttest results for BkSq and HCl.

Discussion. The significant improvement in BkSq and HCl demonstrates the effectiveness of participation in regular strength training. Increase in BkSq was 8% and 7% for the EOT and CT, respectfully, and in the HCl 9% and 26% for the EOT and CT, respectively. The relatively larger increase for the CT on the HCl was attributed to neuromuscular efficiency and combined strength and technique improvement for this more technical lift.

Conclusion. Thirteen weeks of EOT or CT three days per week are similarly effective in producing significant strength gains on the BkSq and HCl.