

HEAVY ELASTIC BANDS ALTER FORCE, VELOCITY AND POWER OUTPUT DURING BACK SQUAT LIFT

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Heavy elastic bands alter force, velocity and power output during back squat lift. National Strength and Conditioning Association Conference, Las Vegas, July, 2002.

The purpose of this study was to examine the effect of heavy elastic bands on the force, velocity, and power output produced during the back squat. Ten male collegiate powerlifters were recruited. After 6RM squat weight was determined for each lifter, three conditions were evaluated. For the no bands (NB) condition the load was provided by the 6RM weight of the barbell alone. For the bands top (BT) condition, the elastic bands were attached to each end of the barbell, and using a force platform under the subject's feet, the weight on the barbell was reduced until the total load on the subject when standing erect was equal to the 6RM load. For the bands bottom (BB) condition, the weight on the barbell was adjusted in the same manner but such that the total load was equal to the 6RM when the subject was in the parallel squat position. The subjects completed a series of lifts under each condition and force, velocity and power output were calculated and averaged over every 10% of concentric bar movement. No difference in force, power or velocity was observed between the NB and BB conditions. However, force during BT was lower for the initial 80% of the concentric movement by up to 0.503BW and 0.849BW for the NB and BB conditions respectively. Bar velocity was significantly higher for the BT condition for initial 50% of the concentric movement by up to 0.209 and 0.295m/s for the NB and BB conditions respectively. Power output was not different between the BT and NB conditions at any point in the squat, however it was higher for the first 50% of the lift for the BT compared to the BB conditions by between 0.37 and 0.72 W/kg.

The use of elastic bands during squatting clearly alters the force, velocity and power output with the greatest differences being when the weight on the barbell is adjusted as in the BT condition. Specifically, this allowed the lifter to produce greater velocity and power over the lower phase of the lift. This substantiates the anecdotal evidence that use of the bands permits the lifter to explode more out of the bottom without being inhibited by having to slow the bar at the top of the lift because the increasing tension in the bands achieves this. Such a technique has practical relevance because it modifies the traditional squat exercise possibly for greater transference to increasing vertical jump and ballistic performance.