THE EFFECT OF HIGH VS LOW-VELOCITY ISOKINETIC STRENGTH TRAINING ON RESTING METABOLIC RATE AND CORRECTION BODY MASS OF OVERWEIGHT WOMEN

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Few studies have focused on the impact of resistance exercise training on fat metabolism. However, the effect of different types of strength exercises for treatment of obesity is not clear. The aim of the study was to compare the effect of low- and high resistance isokinetic strength training in rehabilitation training program middle age women without a concomitant diet on body mass and resting metabolic rate (RMR).

19 untrained overweight female (39-50 yrs, BMI 33.07±2.71 kg/m²) were matched for age, body mass index, training history and randomly assigned to high-resistance (group 1, n=10) and low-resistance (group 2, n=9) training groups. The subjects of group 1 were used supervised slow-speed resistance isokinetic strength training (Concept device) the lower and upper body at 75-85% and 60-70% of the individual 1RM (8-10/12-15 repetitions per set, 3 sets) 2 day per week for 16 weeks (duration of one session 80 min). The subjects of group 2 were used high-speed resistance isokinetic strength training. Baseline 1 RM testing was completed every week. The determining of fat folds and oxygen uptake in supine rest (indirect calorimetry – Cosmed) was performed before (week 0), on week 8 and 16.

The results showed that significant variation in resting oxygen uptake was observed between baseline measure (week 0) and 16 weak in both groups. Mean lower and upper body maximal strength significantly increases in group 1 and 2 (10 and 16%, respectively). BMI in (1) and (2) groups was decreased ( -6.7 and -7.1%). From 8 to 16 weeks training resting oxygen uptake significantly increase in low-resistance training group only from 108.9±4.9 on week 8 to 126.5±6.2 ml/min/m² on week 16 (p<0.05). Post-trained decrease of percent of fat in group 2 was significantly more (-8.7±1.3%) than in group 1 (-5.2±1.1%). Resting oxygen uptake related to fat-free body mass showed a significant increase in low-resistance training group only (from 4.17±0.06 to 4.98±0.07 ml.kg⁻¹.min⁻¹).

We concluded that strength exercises represent of great importance form of physical loads in rehabilitation programs of overweight women. High intensity isokinetic low- and high-velocity strength training for 8 and 16 weeks significantly improve RMR. The results support the supposition that strength training represents an adequate alternative to aerobic endurance training in women rehabilitation training programs. These data indicate that consideration of the role of physical exercises, as a mere factor of caloric expenditures is insufficient for explanation of its full effects, including the case of excessive weight rehabilitation. The data demonstrate that high-velocity strength isokinetic exercises (in comparison to low-velocity exercises) were a more effective factor for enhancement the efficiency of metabolism self-regulation in overweight women by increasing of energy expenditures in post-exercise rest.