

Effect of Resistance Exercise on Hypothalamic-Pituitary-Gonadal Axis

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Abstract : Abstract: Introduction: Physical activity may be related to male reproductive function by affecting on the hypothalamic-pituitary-gonadal (HPG) axis. Our aim was to determine the effects of 6 weeks resistance exercise on reproductive hormones, HPG axis. The hypothalamic-pituitary-gonadal (HPG) axis refers to the effects of endocrine glands in three-level including (i) the hypothalamic releasing hormone GnRH, which is synthesized in a small heterogeneous neuronal population and released in a pulsatile fashion, (ii) the anterior pituitary hormones, follicle-stimulating hormone (FSH) and luteinizing hormone (LH) and (iii) the gonadal hormones, which include both steroid such as testosterone (T), estradiol and progesterone and peptide hormones (such as inhibin). Hormonal changes that create a more anabolic environment have been suggested to contribute to the adaptation to strength exercise. Physical activity has an extensive impact on male reproductive function depending upon the intensity and duration of the exercise and the fitness level of the individual. However, strenuous exercise represents a physical stress and inflammation changed that challenges homeostasis. Materials and methods: Sixteen male volunteers were included in a 6-week control period followed by 6 weeks of resistance training (leg press, lat pull, chest press, squat, seated row, abdominal crunch, shoulder press, biceps curl and triceps press down) four times per week. Intensity of training loading was 60%-75% of one maximum repetition. Participants performed 3 sets of 10 repetitions. Rest periods were two min between exercises and sets. Start with warm up exercises include: The muscles relax and stretch the body, which was for 10 minutes. Body composition, VO₂max and the circulating level of free testosterone (fT), luteinizing hormone (LH), follicle-stimulating hormone (FSH), sex hormone binding globulin (SHBG) and inhibin B measured prior and post 6-week intervention. The hormonal levels of each serum sample were measured using commercially available ELISA kits. Analysis of anthropometrical data and hormonal level were compared using the independent samples t- test in both groups and using SPSS (version 19). $P \leq 0.05$ was considered statistically significant. Results: For muscle strength, both lower- and upper-body strength were increased significantly. Aerobic fitness level improved in trained participant from 39.4 ± 5.6 to 41.9 ± 5.3 ($P = 0.002$). fT concentration rise progressively in the trained group and was significantly greater than those in the control group ($P = 0.000$). By the end of the 6-week resistance training, serum SHBG significantly increased in the trained group compared with the control group ($P = 0.013$). In response to resistance training, LH, FSH and inhibin B were not significantly changed. Discussion: According to our findings, 6 weeks of resistance training induce fat loss without any changes in body weight and BMI. A decline of 25.3% in percentage of body fat with statistically same weight was due to increase in muscle mass that happened during resistance exercise periods. Six weeks of resistance training resulted in significant improvement in BF%, VO₂max and increasing strength and the level of fT and SHBG.

Keywords : resistance, hypothalamic, pituitary, gonadal axis

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