Available online at www.sciencedirect.com

SciVerse ScienceDirect

Procedia - Social and Behavioral Sciences 46 (2012) 311 – 315

Procedia
Social and Behavioral Sciences

WCES 2012

The effect of endurance, resistance and concurrent trainings on plasma leptin levels of non-athlete males

Mohammad Hassan Ferdosi [a]*, Mohammad Reza Asad[b]

[a]*Department of physical education and sport, Payame Noor University,PO BOX 19395-3697,Tehran, IRAN*
[b]*Department of physical education and sport, Payame Noor University,PO BOX 19395-3697,Tehran, IRAN*

Abstract

The aim of this study was to investigate the effect of endurance, resistance and concurrent trainings on plasma leptin levels of non-athlete males. In order to achieve the purpose, 48 male students in Tehran University with a mean age of 21/45 year were invited to participate in this study. Subjects were randomly assigned to three exercise groups, endurance group (12 = n), resistance training group (12 = n) and concurrent training group (12 = n) and a control group (12 = n). Height, weight, fat percentage, BMI index and VO_2 max were determined before. Blood samples were taken in fasting state from all subjects. Then endurance group received endurance training for 8 weeks, 3 sessions per week with an intensity of 75-85% maximal heart rate. For Resistance training group also determined the 100 per cent power of individuals, first .Then were prescribed a percentage of maximum power during the exercise sessions for them. Concurrent group received both endurance and resistance training programs in one day. In order to compare pre-test results with post test results was used paired t-test and ANOVA. The results showed that all three methods of endurance, resistance and concurrent trainings caused a significant decrease in plasma leptin levels. Moreover, it became clear that in all three groups, according to F statistics and P values (982/0P =), There is no significant difference the effect of endurance, resistance and concurrent trainings on decrease of plasma leptin. So Regular physical activity (any type of endurance, resistance or concurrent trainings with a negative energy balance) is likely can lead to a decrease in leptin levels.

Keywords: Leptin, endurance training, resistance training and concurrent training

1. Introduction

Leptin is a anti-appetite hormone. In addition this hormone to its role in protecting tissues against hunger (to starve), its main function, is adjusting the amount of triglycerides in cells other than fat cells. In this case, leptin in other cells, is beneficial to prevent accumulation of excess fat and maintain the appropriate amount of triglycerides (Toussirot,2005). Moreover, the increase in size and amount of fat cells is associated with increased leptin levels that is more important the factor of fat cell size in women, and number of cells in men (Perez,2001; Olmedillas,2011).The Increase in size and number of fat cells help to increase of leptin levels that the size factor, is more important than the number of fat cells (Par Deus,2000).We can cite to studies about of the relationship between leptin and physical activity in humans, that be done by "Jennifer Olive," and his colleagues in 2001. In this study was examined the effect of different intensities of running exercise on plasma leptin levels in healthy and

* Mohammad Hassan Ferdosi Tel.: +98-917-719-3557
E-mail address: mferdowsi1359@gmail.com

 doi:10.1016/j.sbspro.2012.05.112

trained subjects. Results did not show difference in measured leptin levels before exercise and after exercise in intense physical activity, but amount of leptin was significant in average practice (Olive,2001). Moreover, insulin and leptin levels were correlated positively. The results showed, body fat, physical activity and fitness levels and insulin, had a significant positive correlation with basic leptin level (**Guilherme**,2010). There are a little and also conflicting information about effects of concurrent and resistance exercises on leptin. Chen, K and collogues did not find change after 6 weeks of resistance training on plasma leptin levels in diabetic patients (Chen,2004). Also Zafeiridis did not observe any change in plasma leptin after he provides various methods of resistance training (Zafeiridis,2003). In contrast, in a survey that conducted by Nindl was observed a significant decrease in plasma leptin concentration after a resistance training session (Nindl,2002). On the other hand Fatouros concluded that after 24 weeks of resistance training protocols on the old man resistance training may reduce plasma leptin concentration (Fatouros,2005). With regard to these researches, so researcher decided to study and evaluate the influence of three methods of concurrent, aerobic and resistance exercises on plasma leptin levels of male non-athletes.

2. Heading styles

This study was semi-experimental type and the subjects were place to different groups of practice randomly. 48 persons were selected as a statically sample and then divided to aerobic training group (12 = n), resistance training group (12 = n) and concurrent training group (12 = n) and a control group (12 = n) finally. Some variables such as height, weight, fat index and BMI of samples were measured before division(Table 1). In order to compare the results of the pre-test with post-test and also to specify the influence of different exercises on some variables was used t test and one-way analysis of variance (One Way ANOVA).

2-1 Aerobic Exercise Protocol

Subjects in this group participated in a long-running exercise that volume and intensity of training for each subject gradually increased at the end of each stage. In first and second week, participants began 25 minutes exercise with 65% of maximum heart rate (HRmax). Subjects were practicing in 3rd-6th Weeks in 35 minutes with the 65 to 75% (HRmax) and weeks 6th to 8th for 40 minutes with 75 to 85% (HRmax). Rate gauge of BEURER was used to control of exercise intensity.

2-2 Resistance training protocol

Every two weeks were applied 100% of the new powers and new percentages. The training program contained upper body training and lower body training, such as: bench press, sitting & standing up with halter, leg extension, leg flexion, leg press and rowing.

2-3 Concurrent exercise protocol

Subjects in this group were doing both of aerobic and resistance trainings in a day, such as they did resistance training first and then endurance training.

2-4 Control group

They didn't receive any endurance, resistance or concurrent exercises and also their variables were evaluated before and after 8 weeks.

2-5 Blood sampling

Before starting the first week of practice and at the end of 8^{th} week training was performed blood sampling. 11 ml of venous blood were taken using sterile tubes containing the anticoagulant EDTA by a laboratory specialist at 8 am. All subjects before blood sampling were fasting for 12 hours. Samples, after centrifugation and separation of serum and plasma were transferred to the laboratory to measure the research variables. To measure of leptin was used ELISA kit (built by KOMA Biotech company).