

THE EFFECT OF 16-WEEK AEROBIC EXERCISE ON LEPTIN, GHRELIN AND OBESTATIN LEVELS IN OLD MEN

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Abstract

Ghrelin is a peptide secreted by the stomach important have role in the secretion of growth hormone, energy balance, appetite, weight and cardiovascular functions the purpose of this study was to determine the effect of aerobic exercise on leptin , ghrelin, obestatin in untrained old men. Methods: 24 healthy old women were selected by convenience sampling method and were random divided into two experimental (n=12) and control (n=12) groups. The exercise protocol included aerobic exercise training lasted for 16 weeks and 3 sessions per week and every session lasted for 60 minutes. Blood samples were taken to measure serum leptin, ghrelin and obestatin before and after training period. Results: The level of serum leptin in old men changed significantly, and so did the levels of ghrelin and obestatin. Conclusion: 16 weeks of aerobic exercise induced significant change in serum levels of ghrelin and, obestatin, while leptin levels reduced in old men.

Keywords: aerobic exercise, untrained old men, leptin, obestatin.

Introduction

Aging is a phenomenon that is associated with several changes in the body. One of the most important consequences of aging is loss of appetite and food intake followed by weight loss. Ghrelin and obestatin peptide secreted by the stomach that Obestatin produced from Ghrelin and obestatin peptide secreted by the stomach called ghrelin that Obestatin precursor protein translation Periprogerlin (Gualillo,2006). Leptin is another hormones that is One of the most important hormone of adipose tissue. It is influences energy homeostasis, neuroendocrine and immune function.

It is also produced in gastricepithelium¹³ and placenta. Leptin is identified to be of the first adipokines related to the body fat mass and the loss of weight and fat percentage is often accompanied by a decrease in the leptin levels (Koerner et al., 2005). Ghrelin decreased in the elderly, aging is associated with anorexia (Kennedy et al., 2004). The authors showed that Gerlinobestatin is sensitive to changes in body composition.

In one research on the 69-year old person found that changes in muscle mass is inversely related to changes in ghrelin (Bertoli et al., 2006). It has been found that gerlin stimulates lipogenesis and thus increases the fatty tissue (Gnanapavan et al., 2002). Environmental factors such as increased availability of high calorie food or decreased need for physical activity contribute to its development and their influence by genetic predisposition (Zang et al., 1994).Ghanbari-Niakiet al.(2007) examined the effects of six weeks running on the Obestatin.

Training program includes five sessions per week and each session consists of 60 minutes of running on a treadmill at a speed of 25 meters per minute obestatin and gerlin decreased.

Weltman et al. (2000), who reported that 30 min of exercise at various intensities and caloric expenditure (from 150 ± 11 to 529 ± 45 kcals) in 7 healthy young men did not cause modifications in leptin levels during the exercise and during the recovery (3.5 hours). This study investigated the effects of a 16-weeks aerobic exercise on, leptin and gerlin and obestatin in 24 sedentary old men.

Subjects

Twenty four healthy-untrained males volunteered to participate in this investigation. Before initiation of the study, subjects were asked to sign a written, informed consent. All subjects completed a medical questionnaire to ensure that they were not taking any medication, were free of cardiac, respiratory, renal, or metabolic diseases, and were not using steroids.

Methods

All subjects randomly divided into 2 groups: Group 1: Control group (n=12, Group 2: Experimental group (n=12).

48 h before starting the training program Weight, Height, body fat, Blood samples and BMI were taken from all the subjects using proper devices/methods. Then, experimental group performed the training program for 3 sessions per week, 30 minute per session for 16 consecutive weeks.

Then another Weight, Blood sample and BMI was taken in the of the training period. Serum levels of gerlin, leptin ,obestatin of all subjects before and after the training period were measured using standard biochemical methods from all the subjects in both groups.

Statistical analysis

All values are reported as Means ±SE. Differences between exercise-induced changes in plasma samples concentrations and body fat before and after exercise protocol were evaluated using a Students t-test for paired samples. A P-value < 0.05 was considered to be statistically significant. As expected, after 8 weeks of exercises, the experiment group showed a significant decrease in weight and fat percentage, leptin. Mean ± standard deviation of two groups show in Tables 1 and 2.

Table 1. Characteristics of study subjects

variable		Control	Aerobic
BMI (kg/m2)	Pre -test	22.31+ 1.72	22.69+ 1.43
	Post-test	23.83+ 1.69	21.43+ 1.37
Leptin(mmicron/ml)	Pre-test	10.546+ 0.673	11.70+ 0.686
	Post-test	10.71+ 0.898	9.199+ 0.679
Gerlin(pg/ml)	Pre-test	52.63+ 2.029	50.66+ 2.09
	Post-test	51.27+ 4.96	60.58+ 7.86
Obestatin(pg/ml)	Pre-test	1.84+ 6.84	1.86+ 6.81
	Post-test	1.86+ 7.10	1.76+ 9.026

Table 2. Hormonal indicators of the subjects, before and after the training program Variable Control group

group	mean differences	sd	leven test			t test
			f value	t value	df	sig
leptin (control)	-0.235	0.317	0.229	-0.743	23	0.466
leptin (experiment)	-2.322	0.253	1.423	0.943	23	0.001
Gerlin (control)	1.354	1.54	16.275	0.875	23	0.391
Gerlin (experiment)	2.350	-9.817	9.097	-4.178	23	0.001
Obestatin (control)	2.848	-2.308	0.001	0.810	23	0.426
Obestatin (experiment)	3.319	3.330	0.335	3.88	23	0.001

Discussion and conclusion

There were significant differences between groups in the levels of gerlin, leptin and obestatin. Our results show decrease in weight, BMI, leptin in exercise group towards the end of period of the training. The levels of serum leptin changed significantly. In addition, during the training, there was significant change in serum gerlin and obestatin levels in exercise groups. The purpose of this study was to examine the effects of aerobic exercise on leptin, gerlin and obestatin. The results show that leptin decreased in subjects that agree with the results of, Iran et al. (2010), Akbarpoor (2011), Fathi Poor (2005), Shahid (2012), Koerner et al.(2005) Baltaci et al.(2005), de Melo et al. (2010), but disagree with the following results. Lambert et al. (2003) stated that plasma leptin, followed by resistance training increases. This difference is because of the type of exercise. Araet et al. (2006) showed that resistance training for six weeks in healthy men leptin levels had no effect on leptin that is because of subjects' age and gender differences.

The results showed that aerobic training on serum levels of Ghrelin affects subjects in this study that is agree with the results of Fathi Poor (2005), Zakavi et al. (2015), Moraes et al. (2015). But it is disagree with the following results Mirzaeiet al. (2008) found that eight weeks of aerobic exercise in obese women without acyl ghrelin levels has led to an increase, while no significant change was observed in the levels of acylated ghrelin. Saghebjo (2010) found that obese men and women to do the management, levels of ghrelin and obestatin obese subjects were lower than those of normal weight. The results showed that aerobic training has a significant impact on serum levels of Obestatin subjects and reduces the amount of Obestatin occurring with results. Ghanbari-Niaki et al.(2010) is consistent. But it is disagree with. Zakavi et al.(2015) examined the effect of exercise six months of Pilates on older obese men increased the amount Obestatin. After aerobic exercise, leptin showed differences when compared to resting values. Besides, there were significant differences in leptin and gherlin levels after 16 weeks of aerobic exercise.

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UČINAK 16-TJEDNE AEROBNE TJELOVJEŽBE NA RAZINU LEPTINA, GRELINA I OBESTATINA KOD STARACA

Sažetak

Grelin je peptid kojeg luči želudac i koji ima važnu ulogu kod izlučivanja hormona rasta, energetske bilance, apetita, težine i kardiovaskularnih funkcija. Svrha ovog istraživanja bila je utvrditi utjecaj aerobnih vježbi na leptin, grelin, obestatin u neutreniranih staraca. Metode: 24 zdrave žene su odabrane metodom pogodnosti uzorkovanja i bile slučajno podijeljene u dvije eksperimentalne (n = 12) i kontrolne (n = 12) skupine. Protokol vježbe uključuje aerobni trening. Vježba je trajala 16 tjedana i 3 sesije tjedno i svaka sesija trajala je 60 minuta. Uzorci krvi uzeti su za mjerenje serumskog leptina, grelina i obestatina prije i nakon perioda treninga. Rezultati: Razina leptina u serumu u staraca je značajno promijenjena, kao i razina grelina i obestatina. Zaključak: 16 tjedana aerobne tjeleovježbe inducira značajne promjene u serumskim razinama grelina i obestatina, dok je razina leptina smanjena u staraca.

Ključne riječi: aerobna tjeleovježba, neutrenirani starci, leptin, obestatin.

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