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Effects of aerobic exercise on SHGB, bone density in overweight middle-aged women

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ABSTRACT

The aim of this study was to Effects of aerobic exercise on SHGB, bone density in Overweight middle-aged women 45 females 38 to 43 years with a body mass index of 38 to 43 into two groups (30 active and 15 inactive) groups. Plan active group consisted of 30 minutes of aerobic exercise per day, five days a week for three months. Aerobic activities include warm-up and cool-down and find the treadmill was 65 to 70 percentVO2max.Blood samples for 24 hours before and 24 hours after the last training session was and IBLGermankits and ELISA test were measured. BMD of the 15 days before the start of the program And 24 hours after the last session was assessed by DEXA. Three months of aerobic exercise on October BMD showed a significant effect (P <0.05).Three months of aerobic exercise does not significant effect on hip BMD (P> 0.05).Impact of aerobic exercise on changes in SHBG (P <0.05). Three months of physical activity on bone density has increased. However, due to differences in bone tissue regeneration of the spine and hip bone to hip bone requires more time and also Physical activity may be Decrease SHBG levels in premenopausal women isOf course, the need for more research in other age groups and in different circumstances are.

Keywords: SHBG, bone density, middle-aged women, aerobic exercise

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INTRODUCTION

According to the definition of the U.S. National Institutes of Health Osteoporosis is a skeletal disease is a disorder of bone strength, leading to a susceptible individual is at an increased risk of bone fractures. Strength bone is reflected in the two main characteristics density and bone quality [16].Due to the lack of methods for measurement of bone quality Osteoporosis based on its density (BMD) is performed. Based on the definition of the World Health Organization (WHO)Comparison of osteoporosis based on BMD (bone mineral density)Individual patients, the mean BMD of the adult population (age and sex with the same period) is detected[12,13]. This disease is an important public health problem in the world and its prevalence is increasing. In Canada, approximately one quarter of women and one eight men have osteoporosis [3]. Studies in other countries confirm the escalating incidence of osteoporosis is and its impact on women's lives, especially in shows[10, 14]. Rapid loss of bone mass in women the onset of menopause due to estrogen deficiency has been [5, 17]. Also been observed in several studies Regular exercise in elderly men and women who safeguard and even increase bone mass has been[7, 9, and 11]. Exercise intervention studies in postmenopausal women Most have reported increased bone mineral density BMD although

there are conflicting reports [2, 11]. Sex steroids are important factors in the growth protection and maintenance of bone mass are. Endogenous and estrogens available circulating two free form or bound to binding proteins such as SHBG And albumin are. While the albumin binding is weak, and hormone binding affinity was stronger with higher SHBG and are available for review [18].Since SHBG testosterone and estradiol has a role in regulating access to, Moderating role on bone metabolism can be considered[4, 20, and 21]. Many studies of the relationship between serums SHBG Bone by a factor independent of endogenous estrogens and have reported. Seen in elderly men that there is a relationship between SHBG and bone mineral density predict [1]. Also been seen in studies High levels of SHBG have been associated with an increased number of fractures and it can be said that the determination of serum as a marker to be used in determining osteoporosis [6]. Since approaching the age of menopause in women increases with age Sex hormones are reduced and the risk of osteoporosis and fractures increases. Factors affecting reduce osteoporosis and the maintenance of bone mass is, On the other hand the role of sex hormones the effect of physical activity on health and endocrine systems seem Improving and maintaining physical activity can control the quality of health In terms of both skeletal and endocrine systems to be effective. According to studies, studying the effects of aerobic exercise on SHBG and bone mineral density in women has received little attention. The purpose of this study is effects of aerobic exercise on SHGB, bone density in Overweight middle-aged women.

MATERIALS AND METHODS

Those in this study45 women 38 to 43 years with a body mass index of 38 to 43 comprised The two groups (n = 30 active, n= 15 inactive) groups. Segmentation is based on active and passive activity level of individuals were considered. Measurement of anthropometric characteristics and general health questionnaire and consent was completed by the individual. All participants of the study not using any supplements or steroids and without type 2 diabetes, and having regular menstrual cycles in the past year. Program working active Group the proposed program of the World Health Organization (WHO),Include 30 minutes of aerobic activity a day, five days a week for three months. Aerobic activities, including warm-up and cool-down and to find a treadmill was 65 to 70 percentVO2max.Blood samples for 24 hours before the start of training And 24 hours after the last training session was BMD of the 15 days before the start of the program And 24 hours after the last session was assessed by DEXA.

Sampling

Five milliliters of blood, in the sitting position and from the left elbow has been taken from a vein in tubes without anticoagulant substance was spilled. For the preparation of serum samples were incubated for 10 min at room temperature and the head of the clot by centrifugation at 2000 rpm for 10 minutes and the minutes were removed. Samples until tests including SHGB were stored in the freezer minus 20 degrees. All the samples in the same conditions (8 am to 9 am, the temperature of 28-26 ° C and humidity of 50%) was performed.

Laboratory measurements

Serum SHGB using IBL kits (SHBG ELISA, Germany) with an automated analyzer product number MX52011 apparatus was measured at an ELISA (Model: multistandard, Type Mashing: plate Reader)of 0 to 3.4 A.

Bone Density measured by DXA method With Machine Lunar DPX Build America on the Sepahan Bone Densitometry Center

Statistical methods

Normal distribution of the data using the Kolmogorov - Smirnov was investigated; since the distribution of data was normal, with mean and standard deviation of the data was described. Then change any of the parameters studied during different stages of the repeated measure ANOVA and post hoc Bonferroni test were analyzed. Differences between the groups were determined using independent t-test. All operations and statistical analysis at five percent significance level using SPSS statistical software version 21 and Excel 2013 were used.

RESULTS

Table 1 Mean and standard deviation of individual features (Age, weight, height, body mass index, percent body fat and aerobic power) is given.

Table 1.Mean and standard deviation of the physiological characteristics of the subjects

Indicators / Groups	Age (years)	Weight (Kg)	Height (cm)	Body mass index (k.m^2).
Active	40.67±1.47	69.96±3.45	159.87±2.95	27.19±1.09
In active	40.87±1.55	68.59±2.95	159.87±2.95	26.66±1.06

Kolmogorov – Smirnov results suggest that Data related to demographic and baseline characteristics measured at the beginning of the normal status. Therefore, the normal values of the two groups can be activated and controlled before running into a natural athlete and was homogenous. Vertebral BMD analysis of variance indicated Three months of aerobic exercise a significant effect on BMD stamp mark And a range of changes in the active group than in the control group(Table 2).ANOVA results indicate that femoral BMD Index Three months of aerobic exercise does not have an effect on hip BMD. The Bonferroni test indicates that Aerobic exercise has no effect on hip BMD. However, active range of hip BMD after exercise than the control group. In other words, the contribution of the effect of aerobic exercise-induced changes in hip BMD was lower than group differences. Therefore, we reject the hypothesis that increases in hip BMD after aerobic training, it can be said that three months of aerobic exercise does not have a significant effect on the increase in hip bone density (Table 2).The results of variance analysis showed that SHBG Aerobic exercise on SHBG changes affect. Range of SHBG changes significantly in the active group than the control group. In other words, the contribution of group differences in SHBG decreased further. Thus, we confirm the hypothesis that the effect of aerobic exercise on reducing SHBG, It can be said that three months of aerobic exercise on reducing the amount of SHBG affects(Table 2).

Table 2.The mean and standard deviation of the studied parameters in both groups, and the measurement phase

Indicators / levels		Placed before exercise	Placed After exercise
Spine BMD	Active	0.8±0.052	0.94±0.072*†
	In active	0.8±0.062	0.8±0.062
Hip BMD	Active	0.92±0.048	1.63±0.87
	In active	0.89±0.053	0.89±0.053
SHBG	Active	68.47±23.1*†	62.18±22.27
	In active	69.8±21.76	70.34±21.34

*Marks * Significant pre-and post-exercise (P <0.05), Marks † A significant complement to the placebo group (P <0.05)*

ANOVA results indicate that Decrease in SHBG increases bone density in both groups was significant. In other words, a decrease in SHBG increases in bone mineral density (hip, vertebrae) are (Table 3).

Table 3-Bonferroni test results within a group for SHBG index

group	Factor		The difference between the two-step	Deviation error	significantly
Active	SHBG2	BMD2-v	61.24*	4.06	0.001
In active	SHBG2	BMD2-v	69.52*	5.518	0.001
Active	SHBG2	BMD2-L	69.429*	5.515	0.001
In active	SHBG2	BMD2-L	60.84*	3.95	0.001

*Marks * Significant pre-and post-exercise (P <0.05)*

DISCUSSION

The aim of the present study Effects of aerobic exercise on bone mineral density and serum levels of SHBG, respectively. This study showed that Aerobic physical exercise according to WHO guidelines in the last three months can lead to a decrease in serum SHBG And increase bone density in the lumbar spine is a significant but not significant increase in hip bone density was observed. Based on these results it can be stated that SHBG serum levels of physical activity reduced and increase bone density also occurs that this increase is meaningful in the lumbar spine But femur may require a longer duration of physical activity may increase bone density.

In studies of Varsavski et al [15] the inverse relationship between SHBG and bone mineral density and have suggested that between SHBG levels and bone mineral density of the hip there is significant relationship and have also reported that SHBG levels were higher in patients with osteoporosis. Also review Yoshimora et al[22] the significant correlation between SHBG and bone mineral density of the hip and were negative. But the research

Rahnema et al [8] 15 weeks of aerobic and resistance exercise leads to an increase in SHBG have participants unlike the results of the present study. California San Francisco, Department of Epidemiology [19]SHBG levels and a weak relationship between the rates of bone remodeling has reported. In contrast, studies Hop et al [6] Represents the increase in fractures with high serum levels of SHBG And said that it can be an indicator in the diagnosis and prediction of fracture can be used.

CONCLUSION

According to the results of previous studies and compared with results from the present study Can be expressed as Three months of aerobic exercise is effective in increasing bone density But probably due to differences in the bone tissue of the lumbar spine, femoral Rate for femoral reconstruction requires more time Physical activity may also lead to a decrease SHBG levels in premenopausal women is The course requires more research in other age groups and in different circumstances are. In this study, power control, and daily activity level of those test there is rest. Each of these factors can be controlled, which may significantly impact the reconstruction and increasing bone density with respect to age, sex and physical condition of individuals is It is recommended that future studies be considered.

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