COMPARISON BETWEEN AEROBIC EXERCISE AND CONSUMPTION OF GREEN TEA ON WEIGHT LOSS IN OVERWEIGHTED MEN

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Abstract

Background: Obesity and overweight are important risk factors that cause avoidable disease and death. Aerobic exercise and the metabolic mechanisms of green tea polyphenols available because it can be effective in reducing body weight. The purpose of this study compared the effects of aerobic exercise for 8 weeks and 8 weeks of green tea for weight loss, men were overweight. Methods: 82 men that are overweight has (Age: 38.91±11.59, Height: 175.08±7.76, weight: 87.4±9.3, BMI: 28.3±1.05, WHR: 1.02±0.33) were randomized to two groups: aerobic exercise (12 cases) and green tea (70 cases) were divided into. 8 weeks of aerobic exercise group (three sessions per week) aerobic exercise intensity between 60 to 70 percent of maximum heart rate did and A group of green tea daily dose of 500 mg tablets of green tea was consumed. Results: The amount of BMI and WHR of the subjects was measured before and after the test. Recorded data were analyzed by paired t-test and covariance analysis. Results showed that both aerobic exercise and consumption of green tea body weight, BMI and WHR was significantly reduced (p< 0.05). Compared to the significant difference between aerobic and green tea consumption on body weight, BMI and WHR were observed in overweight men. Conclusion: This study showed that green tea consumption due to aerobic training can increase metabolic rate of body weight, BMI and WHR to be effective.

Keywords: aerobic exercise, green tea, overweight

Introduction

Prevalence of fatness and additional weight is increasing all around the world. Nowadays, there are more than 250 fat people all around the world that implies 7 percent of the world total adult population. Fatness and additional weight are risk factors for some diseases and metabolic disorders such as cordial and vascular diseases, blood pressure, type 2 diabetic and hyper lipid diseases. In the world, also about 300,000 people die because of fatness and its complications. Effect of fatness and additional weight on life decrease and effecting by various diseases is in extent that some life insurance companies in America take account life decrease up to two years per 2.5cm around abdomen bigger than chest around and take account one year of life decrease per each 4kg additional weight. This problem and the problems due to it have led to a progressive increase in researches in the field and quality of treatment it (Powers & Howley, 2004). Various methods are applied to prevent and/or treatment of additional weight. Using aerobic is one of these methods. In this direction, it has been indicated in a research that aerobic exercise is remarkably effective on fat metabolism of fat people with additional weight (Wolf, 2006). This indicates that fat metabolism of fat people with additional weight who were participating in aerobic increased. In a review study during 1986 to 2000 with investigation of 4 papers about 2419 adult people, it was concluded that aerobic exercise for few times, repetition and intensity can effect on decrease in peoples’ weight (Appel & Champagn, 2008). Another method is using low calorie food diet, which because of negative energy balance leads to decrease peoples weight. Although America national health institute advice limited calorie with an increase in physical exercise, most studies indicate decrease in weighing due to a low calorie diet (Cummings et al., 2002).

So, considering the performed studies can conclude that aerobic exercise and good diet are two effective methods to decrease weight. Now, various methods have been used as substituting for food diet , one of these methods is using weigh reducer industrial drugs that have been confirmed, they includes low effectiveness and undesirable complications. Various methods are applied as replacement of industrial drugs to decrease weight, one of them is using medicine plants like green tea. Green tea is consumed in various countries widely and many morphological effects have been reported for it. Green tea has been introduced as an anti inflammatory, anti oxidation, anti mutation and anti cancer (Tsuneki et al., 2004). Tablet of green tea has been studied in very few clinical researches and any one has not advised to consume in order to reduce weight absolutely (Shixian et al., 2006).
In a research, the effect of green tea on the males’ weight was studied, the results indicated that the present evaluations cannot support surely the role of green tea in decreasing body weight and more researches are needed (Thavanesan, 2011). In a research effect of green tea on mice’s total weight with full fat diet, the results revealed that consumption of green tea decreased up to 2 percent of total weight during the 8 weeks that is was a higher rate in the experimental group in comparing with control group (Bajerska et al., 2011). Since, consuming aerobic exercise and green tea is the easiest way to decrease weight in comparison with good diet and considering this matter that green tea has been investigated in very few clinical researches and any one of them has not advised to consume it in order to decrease weight, therefore it seems necessary to perform more researches to determine effectiveness rate on body weight that may have properties of weight reduction. Considering the mentioned explanations, the aim of the present study was to compare the effect of 8 week aerobic exercise and consumption of tea green on reduction of men’s weight with additional weight.

Methods

Subjects
The examinations of the research include 82 men with age 18-60 with BMI between 25-30 townships of Isfahan with weight range 87.4 ± 9.3kg and index of body mass between 28.3±9.3kg/scum that were selected intentionally, that were selected and placed in two groups of aerobic exercise (12 people) and green tea (70 people). After fulfilling the questionnaire relevant to medical history and physical activity level it was found that these persons had not any cardiac and vessel diseases, digestive disorders and also active physical exercise level. And they announced their tendency to participate in the research.

Study Design
The present study was in type of semi experimental study and contains two groups of aerobic exercise and consumption of green tea that was done via pretest and posttest for both groups. The present research is applicable, considering the time duration in cross type and using the results.

Exercise protocol
In an aerobic exercise group, the exercise program includes a 8 week aerobic exercise with intensity between 60 to 70 percent of the hearing beat as their maximum that includes three parts of the warm up (5 minutes), the main exercise program (walking for 30 to 45 minutes) and recovery (5 minutes). The control way of heart beat during exercise was in this way that by the polar digital thermometer, first the person’s age was measured, then maximum heart beat was measured by formula of age-220 and through that the percentage of target heart beat was obtained in every section.

The thermometers were connected to all persons one time in each several minutes sequentially. The mean time of exercise and its work intensity was increased gradually until the final week per maximum heart beat of under examination men; first and second week’s activity intensity was 60-65 percentage of maximum heart beat for 30-35 minutes, then from third week until the eighth weekend, activity intensity was 65-70 percentage of maximum heart beat for 35-45 minute. The anthropometric indexes such as height, weight, BMI, WHR were measured at beginning the study (table 1).

Environmental conditions
Wet and dry bulb temperatures were taken during each trial. Wet bulb temp averaged 14.9°C and 15°C (p=0.6273)

Supplement
In a green tea group, the attenders consumed a tablet of green tea with dosage 500mg that contained leaf powder of green tea and 50mg caffeine with water while their stomach was empty at 10 o’clock every morning during 2 months. For each person

Statistical Analyses
Subject, aims and method of study were explained to the patients and then if they were propensity to participate in this study, conscious written testimonial was taken from them. The couplet - test was used in order to compare the data before and after study, and the covariance analysis test was used to compare the data between groups and the obtained results were analyzed via SPSS software; version 16 and the significance level were considered up to P ≤ 0.05.

Results and discussion
The anthropometric indexes of the examinations include body weight, body mass index and WHR before and after 8 week interference have been shown in table 1. As the findings of table one indicate, 8 week aerobic exercise has effected significantly on body weight, body mass index and waist to seat ratio of men with additional weight (Ps≤0. 05). Also, 8 week consumption of green tea tablet has effected significantly on body weight, body mass index, are waist to set of men with additional weight (Ps≤0. 05). But, about difference between two groups of aerobic exercise and effect of consumption of green tea tablet on body weight, body mass index and waist to salt ration of men with additional weight any significant difference was not observed. The present study indicated that a 8 week aerobic exercise has effected significantly on body weight, body mass index and waist to salt ration of men with additional weight (Ps≤0. 05). Also, 8 week consumption of green tea tablet has effected significantly on body weight, body mass index, are waist to set of men with additional weight (Ps≤0. 05).
Table 1. The anthropometric indexes such as height, weight, BMI, WHR before and after 8 week interference

<table>
<thead>
<tr>
<th>Consumption of green tea</th>
<th>Aerobic exercise</th>
<th>Group 5</th>
<th>Pre-test</th>
<th>Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>86/635± 9/517</td>
<td>88/400±5/327</td>
<td>Pre-test</td>
<td>86/775±11/19</td>
<td>Post-test</td>
</tr>
<tr>
<td>85/761± 9/108</td>
<td>86/421±11/047</td>
<td>Pre-test</td>
<td>85/935±0/968</td>
<td>Post-test</td>
</tr>
<tr>
<td>28/290± 1/069</td>
<td>28/895±20/868</td>
<td>Pre-test</td>
<td>104/851±11/647</td>
<td>Post-test</td>
</tr>
<tr>
<td>27/935± 0/169</td>
<td>27/895±20/868</td>
<td>Pre-test</td>
<td>104/350±2/560</td>
<td>Post-test</td>
</tr>
<tr>
<td>104/810± 6/393</td>
<td>102/833±2/579</td>
<td>Pre-test</td>
<td>101/642±6/350</td>
<td>Post-test</td>
</tr>
<tr>
<td>101/642± 6/350</td>
<td>102/433±2/325</td>
<td>Post-test</td>
<td>101/034±0/367</td>
<td>Pre-test</td>
</tr>
<tr>
<td>1/089± 0/348</td>
<td>1/016±0/366</td>
<td>Pre-test</td>
<td>1/034±0/348</td>
<td>Post-test</td>
</tr>
</tbody>
</table>

Figure 1. Difference of pre-test, post-test of aerobic exercise and effect of tablet on body weight

Figure 2. Difference of pre-test, post-test of aerobic exercise and effect of consumption of green tea tablet on body mass
But, about difference between two groups of aerobic exercise and effect of consumption of green tea tablet on body weight, body mass index and waist to salt ration of men with additional weight any significant difference was not observed. The results of this research are proportional to Bryant's and et al findings about the effect of aerobic exercise on body weight and body mass index and WHR of men with additional weight (Bryant et al., 2011). Investigating the results of Martin’s and et al researches in which effect of aerobic exercise on the reduction of body weight was studied, it was indicated that aerobic exercise reduces body weight and MBI (Martins et al., 2010). Rakel Kali and et al investigated the costs of sport energy; effects of exercise prescription on fatness in which it was determined that aerobic exercise reduces body weight remarkably (Colley et al., 2010). Kelly and et al in their review paper concluded that it is better to do aerobic exercise with medium intensity and with 40-60% consumption of maximum energy for 30-45minutes during most days of a week that reduces body weight, BMI and WHR (Kelley et al., 2001).

Considering the above researches, it seems that aerobic exercises play an important role to reduce body weight. The metabolic mechanisms by which aerobic exercise reduces and/or keeps body weight are included: an increase in the cost of energy, increase in recalling fat through increasing activity of fat tissue, slight increase in relax metabolism after exercise, possible increase in thermogenic reaction toward food, if time of exercise is closed to time of eating food. Minimization of decrease in body net weight leads to progression of moral performance, to delay reduction of the basic metabolic rate considering feeding limitations and possibly better control of appetite (Epstein & Wing, 1980).

The results of the present research about the effect of consumption of green tea on body weight, body mass index and WHR of men with additional weight are proportional to findings of Yung Kang and et al, because after 12 weeks of aerobic exercise, body weight and also rate of blood glucose decreased significantly (Yong et al., 2010). Investigating results of Taosan’s research in which effect of green tea on body fat was studied, the results indicated that present assessments can't not support surely the effect of green tea on the reduction of body weight and need more investigations (Thavanesan, 2011). This contradiction can be due to lack of consumption of green tea proper dosage, insufficient time of consumption and drinking green tea while the stomach is full, because the quotations which are poly phenol elements of green tea has the most effect on empty stomach, so the consumers of green tea should not have digestive diseases that it is not proportional to the present research. Results of Bajreska’s and et al research who studied the effect of green tea essence on total body weight of mice with full fat food diet indicated that consumption of green tea reduced significantly total body weight up to 2% and BMI was seen in the control group (Bajerska et al., 2011) that is proportional to the present research.

Considering the contradictory results of above mentioned researches, it seems that cations which are poly phenol elements of green tea make tea to produce heat via controlling the destruction of epinephrine light, this effect of quotations increases oxidation in mitochondria and reduce simultaneous production of ATP and heat is produced by this way that the final rate of metabolism is increased and it leads to decrease body weight, BMI and WHR. For possibly any research was not done about the comparison between two methods of aerobic exercise and consumption of green tea on body weight, BMI and WHR in men with additional weight, and considering the obtained findings from present research, there is not any significant difference between both methods of aerobic exercise and consumption of green tea tablet on weight and body mass index and WHR in the men with additional weight, thus its possible reasons are as the following: 1) Both methods lead to increase in the rate of body metabolism and subsequently increase in the cost of energy; 2) Both methods produce heat. Considering the above common cases, we can conclude that effect mechanism of both methods for reduction of weight is slightly similar to each other and finally considering daily duration of consumption of green tea tablet, comparing to perform aerobic exercise which is done three sections during a week, we can conclude that effect of aerobic exercise in more effective on men’s weight than consumption of green tea. Therefore, contrary to wrong consumption of some people about consumption of green tea tablet as an independent therapeutic way to decrease peoples’ weight, the findings of this research revealed well that consumption of green tea tablet can have few effects on peoples’ weight in comparison to aerobic exercise.

**Conclusion**

This study indicated that both methods of aerobic exercise and consumption of green tea can effect on body weight, body mass index and WHR because of an increase in the rate of body metabolism. Thus , there is not any significant difference between effect of both methods of aerobic exercise and consumption of green tea tablet on weight, body mass index and WHR in men with additional weight.
Gholamreza, S., et al.: Comparison between aerobic exercise and consumption of... 

**References**


USPO REDBA AEROBNE TJELOVJEŽBE I KONZUMIRANJA ZELENOG ČAJA NA GUBITAK TEŽINE KOD PRETILIH MUŠKARACA

**Sažetak**

**Pozadina:** Pretilost i prekomjerna tjelesna težina su važni čimbenici rizika koji uzrokuju bolest. Aerobne vježbe i metabolici mehanizmi polifenola zelenog čaja mogu biti na raspolaganju, jer to može biti učinkovito u smanjenju težine. Svrha ove studije je usporediti uinke vježbanja i uzimanja zelenog čaja kroz 8 tjedana.

**Metode:** Uzorak je sastavljen od 82 ljudi s prekomjernom težinom (Dob: 38.91±11.59, Visina: 175,08±7,76, težina: 87,4±9,3, BMI: 28.3±1.05, WHR: 1.02±0.33) i podijeljen u dvije skupine: aerobne vježbe (n=12) i zeleni čaj (n=70). Vježbalo se tri treninga tjedno aero bne vježbe intenziteta 60-70 % max otkucaja srca. Druga skupina uzimala je dnevnu dozu od 500 mg tablete zelenog čaja. Rezultati su analizirani su parnim t-testom i analizom kovarijance, i pokazali su da su i kroz aerobne vježbe i konzumacijom zelenog čaja, masa, BMI i WHR znatno smanjeni (p<0,05). Značajne razlike između vježbi i pijenja zelenog čaja na masu, BMI i WHR zabilježene su. 

**Ključne riječi:** aerobno vježbanje, zeleni čaj, pretilost

Authors’ observation

Moreover, contrary to researcher’s strict advices about conditions and correct and on time consumption of green tea it was impossible to fully control this variable and also the research was not done in completely experimental conditions, thus it was impossible to full control of feeding in participating men and this can effect on the obtained results. So, it is suggested that to perform a research in fully experimental conditions and full control of food diet

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