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Effects of Regular Physical Activity in Water with and Without Ginger Supplementation on Adiponectin in Obese Female with Breast

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1. Abstract

1.1. Background: The aim of this study was to determine the Effects of regular physical activity in water with and without Ginger supplementation on adiponectin and related biochemical markers in obese female with breast cancer.

1.2. Methods: The population of the study, 40 women with a mean age of breast cancer patients (47±9.5), weight (78±8.1) kg and fat mass (8.51±4) formed that voluntarily participated in this study. subjects were randomly divided into four groups (Group 1: placebo, Group 2: Selected exercises in water placebo, Group 3 and Group 4 supplementation Ginger: Ginger supplements selected exercises in water) were divided into groups of ginger supplements and exercise The Water Department ginger supplements daily for 6 weeks orally 4 capsules (750 mg) were used. Programs supplement group ginger exercise and water exercise group placebo juice containing a combination of increased intensity and distance training, with 50% to 75% heart rate reserve for 60 to 75 minutes in a pool with a width of 15 meters and a depth of 4 m, 4 times a week 6 weeks was performed. Fasting blood samples were collected at pre-test and post-test.

1.3. Result: Ginger supplements or exercise in water increase adiponectin was compared to baseline. However, the exercise group in water exercise with ginger showed a much better effect on the inflammatory marker adiponectin and blood, than the exercise group in water with placebo or the ginger group alone.

1.4. Conclusions: The findings show that a protective effect of non-pharmacological strategies such as exercise in water and plant anti-inflammatory agents such as ginger has been detected in inflammatory and metabolic responses in obese women with breast cancer.

2. Introduction

Studies show that breast cancer is the most common cancer among women and second cancer death after lung cancer worldwide, especially in developed [1, 2]. Statistics of breast cancer in Western countries, according to some reports, this rate was not less than 120 per hundred thousand people, which is even higher than in some Western countries [3]. Breast cancer prognosis and choice of treatment depends on several factors. The most important factor in smoking, obesity, age at menarche, oral contraceptive pill, diabetes, hyperlipidemia, involvement of axillary lymph nodes, the presence of estrogen and progesterone receptors, P53, protein, cathepsin D and human epidermal growth factor receptor-2 [4-6]. It is a multifactorial disease and breast cancers are hormonal status, reproductive history, previous breast disease, anthropometric measures, demographic and family history of breast or ovarian cancer risk associated [7-10].

World Health Organization recently declared that 25 percent of breast cancer in the world has announced the result of overweight

and sedentary lifestyle [11]. It is clear that obesity is a risk factor for developing breast cancer in postmenopausal women [12, 13]. Furthermore, it has been demonstrated to increase the incidence of breast cancer and adipose tissue is associated with a higher incidence of mortality [14]. However, although the effect of physical activity on reducing body fat in different people, but the influence of activity on the environment, especially water with additives such as anti-inflammatory ginger floating in obese women with breast cancer studied and carry out research in this area can Antioxidant some confusion about the role of physical activity as well as anti-inflammatory response. The year so far, the scientists were able to discover the effects of biological control agents and to treat the Maed et al., Adiponectin hormone called adiponectin, the family discovered that the biological effects controls [14].

Adiponectin deficiency can be an early sign of heart risk-Vascular risk factors contribute to atherosclerosis and atherosclerotic plaque progression may be accelerated. On the other hand, in women after menopause, the main source of fat tissue Armataz (the enzyme that converts androgens to estrogens) and increasing the size and number of fat cells in obese patients may contribute to the strengthening of Aromatase androgens. Furthermore, the increase in adipose tissue by increasing blood fats and reducing harmful levels of adiponectin and insulin levels and insulin-like growth factor type (IGF-1) which is involved in breast tumor progression and is related to Mutagenic activity [15].

The role of physical activity in preventing disease and improving health and wellbeing of people who are not covered. Seems to have a positive effect on physical activity and mental health of cancer patients [16]. However, the reported levels of physical activity after a breast cancer diagnosis significantly reduces [17, 18], and even after the treatment is done only slightly [19]. Physical activity is associated with quality of life [20, 21], and Patients who reported their activities during the treatment period and then permanently reduce, the lowest quality of life [17]. Physically disabled patients as compared to patients with more severe fatigue in physically active lifestyle experience [14]. This in turn is ruining their quality of life [22].

Numerous studies have been conducted on the effects of aerobic exercise on adiponectin [23-26]. Ferguson et al., reported that a single session of aerobic activity had no effect on adiponectin and leptin, but increased insulin resistance [27]. On the other hand, despite their effectiveness in controlling stress and inflammation caused by certain medications, as well as reports of numerous adverse side effects and is presented. Ginger plants including medicinal plants, particularly in Iran, which has been introduced in Iranian traditional medicine as an anti-inflammatory herb [28]. Despite multiple reports of the antitumor effects of this plant, known mechanisms of these effects, reducing inflammation occurs [2-7]. Several studies have also shown that the modulation of immune responses capable of exacerbating inflammatory cell extract [3]. In line with the anti-inflammatory effects of plant drought, the analgesic effect induced by acetic acid plant is shown [29]. Will be more marked effects like reduced fat or sugar and anticancer activities of this plant, particularly through the mechanisms modulating the inflammatory processes [4]. In line with several reports have shown anti-inflammatory effects of this plant the active compounds in plants like ginger, plummet and curcumin inhibits the ability to produce well Prostaglandin's, even vs nitrite and NO are involved in inflammation [7, 10]. In addition to producing enzymes specifically mediate the inflammatory ingredients in this material are inhibited Ginger [8].

In the meantime, however, still a number of medications and treatments prescribed for the control of cancer cells and their role of these approaches are often, but experts believe that the use of drugs and procedures such as chemotherapy often associated with side effects such as pain and fatigue. Hence, the use of non-pharmacological strategies such as anti-inflammatory and antioxidant supplements to reduce adverse effects in cancer has spread in recent decades. Although several researchers have endorsed the role and effectiveness of ginger in decreasing inflammation, the effect of nonpharmacological approaches to obesity on markers such as Adiponectin in obese women with breast cancer, especially in Iran, have not been seriously investigated and hence necessitates further research in this area. Hence, the aim of the present study the effects of exercise in water for 6 weeks with or without supplementation of ginger on inflammatory markers in overweight women with breast cancer.

3. Materials and Methods

Quasi-experimental research methodology, and applications that were studied in four groups of human subjects in two phases: pretest and post-test changes in blood lipids and inflammatory markers. After describing the design goals of 40 women with breast cancer, in Babol city during the years 2019 to 2020 confirm that the disease has been diagnosed with physician supervision and sampling randomly divided into experimental and control groups of ten and a double-blind, respectively. Table 1 shows the characteristics of the study subjects (Table 1).

Research protocol is used in the pre-test - post-test. For sampling and radiation oncology centers and pathology labs Rohani hospital and Pathology Laboratory was presented. Independent variables include water exercise, herbal supplement ginger, biochemical variables and dependent variables, including adiponectin were included. The questionnaire also included a three-day food records and physical activity levels. Research training protocol for 6 weeks and 4 weeks, each session was 60 minutes in the pool to a depth of 4 meters. Ginger herbal supplementation protocol as 7 days per week for 6 weeks to 3 mg Herbal Supplement was conducted in two groups. Blood between 7 am to 9 am and then fasted

for 12-hour contralateral hand vein surgery in the sitting position of 10 ml was obtained. For the separation of blood plasma in tubes containing sodium heparin and EDTA tubes for serum separation were cast. Blood at 10000 g at 4° C was centrifuged for 10 min. Serum and plasma was isolated at 80 - Level C was maintained.

All quantitative variables were normalized using Kolmogorov-Smirnov (KS) normality of distribution was studied. To compare each of the variables in the study before and after 6 weeks of exercise in water or supplementation of ginger Paired t-test between control and treatment groups were analyzed using one-way analysis of variance. In the present study, data were analyzed using SPSS23 software ($p<0.05$).

4. Results

The results of this study indicate that 6 weeks of aerobic exercise in water or ginger supplements increased 21% in the training group, increase of 7% in the ginger group and a significant increase in the amount of 45% of the combined group, while that is still below the levels in the control group and even shows a decrease of 7% compared to the pre-test and post-test (Table 2, 3).

The results can be seen in Table 3, the mean and standard deviation only the amount of Adiponectin in the aerobic exercise group compared to the pre-test and post-test water -1.79 ± 1.5 was found that the value of t equal to -3.70 is significant at the alpha level of 5%. Nevertheless, it is quite close to the significance level (Table 4).

The results can be seen in Table 4, the mean and standard deviation values of adiponectin ginger supplementation group in pre-test and post-test compared to the amount equal to t=1.08 is not significant at the alpha level of 5%. The value obtained for the index of insulin t=0.67 and p=0.516 shall Ginger indicating no significant difference in serum insulin in women with breast cancer compared with the period before supplementation of ginger (Table 5).

The results can be seen in Table 5 the mean and standard deviation of the difference is significant parameter examined in the study group workout supplements in water and ginger in comparing pre-test and post-test.

Table 1: Mean and standard deviation of the physiological characteristics of the study subjects

Variables	Group	Control	Exercise in Water	Supplemenation	Water workout supplements	Significant amount (P)
Age	Mean	50	47	46	47	0.434
	SD	3	5	5	4	
Weight	Mean	72	74	78	75	0.297
	SD	10	6	8	9	
Stature	Mean	155	157	156	156	0.949
	SD	5	7	5	4	
BMI	Mean	31	30	32	33	0.725
	SD	3	4	3	6	
Fat	Mean	42	43	39	42	0.263
	SD	3	5	3	4	

Table 2: Mean & standard deviation of index terms (mg/ml) in pre & post-workout supplements

Group	Variable	Adiponectin
Control	Pretest	8.42±0.86
	Posttest	7.80±1.02
Practice	Pretest	8.64±0.99
	Posttest	10.4±1.52
Ginger	Pretest	8.02±1.00
	Posttest	8.55±1.06
Practice+ Ginger	Pretest	8.17±0.74
	Posttest	11.86±0.73

Table 3: Paired t-test indicators in the study after 6 weeks of training in water

Statistics						
Variables	N	Average	SD	df	t	sig
Adiponectin	40	-1.79	1.5	9	-3.76	0.004

Table 4: Paired t-test indicators in the study after 6 weeks of supplementation Ginger

Statistics						
Variables	N	Average	SD	df	t	sig
Adiponectin	40	-0.531	1.54	9	-1.08	0.307

Table 5: Indicators related t test after 6 weeks of training in the water and ginger supplements

Statistics						
Variables	N	Average	SD	df	t	sig
Adiponectin	40	-1.85	1.5	9	-3.56	0.003

5. Conclusions

The present study investigated the effect of 6 weeks of regular exercise in water and ginger supplementation on Adiponectin in patients with breast cancer. The field was full of water and ginger in a regular exercise has been significantly increases the levels of Adiponectin in the two groups (exercise and practice - supplement); and in particular the combined approach, while the control group Adiponectin amounts of ginger supplementation has remained low. In addition, the study showed a significant difference between the groups was significantly increased compared with pretest levels Adiponectin that is the reduction in the group's control-Practice, Controls-Combined, Practice-Combined, Ginger-practice, & practice-mixed. The results of this study are consistent with findings Garekani et al., Some studies also confirmed the findings of the study reported a significant increase in adiponectin concentrations after resistance exercise with moderate to severe [30]. Therefore, examined the effects of 6 months of resistance exercise intensity-different low and moderate intensity of 50% and above 80% RM 65% of the elderly adiponectin and finally reported that adiponectin significantly increased after exercise intensity is moderate to severe However, the low intensity remains unchanged [31].

Brooks et al., study on the present study are consistent with diabetes. The team of 16-week exercise program of strength on the parameters before Anti-inflammatory Adult Spanish hybridization with type 2 diabetes were investigated and found that exercise reduces serum cytokine inflammatory Creactive protein and causes increased cytokine anti-inflammatory adiponectin in patients [5]. However, the result of the present study is consistent with results of other studies [32, 33].

Ahmadizad et al., reported that 12 weeks of strength training (including 11 stations in motion the circular regions of 3 days per week for 12 weeks, each session is about 60 minutes 60-50% of subjects) and training endurance (running for 80-75% maximum heart rate, maximum 3 days per week for 12 weeks) caused significant changes in plasma adiponectin levels as an indicator of the subjects is not an anti-inflammatory. They stated that low-intensity exercise may be due to change in adiponectin. The results of this study showed that the effect of aerobic training on plasma adiponectin increases and the absolute values of the patients was approximately twice the accumulation [34].

In line with the results of Atashak et al., long-term effects of resistance exercise on plasma adiponectin levels and lipid profile in obese men looked at the results of this study indicated: Adiponectin levels after 10 weeks of progressive resistance training in the training group compared with the control group was significantly higher [35]. Olson et al. study found resistance training significantly increased the concentration of adiponectin and C-reactive protein levels in overweight women are the basis [36]. However, the result of the present study is consistent with results of other studies [31]. In addition, the group recently found that despite the fact that (16 weeks of resistance training 2 times a week), with dietary restriction improves Cardiac – Vascular risk factors obesity is a disease in men, but decreased adiponectin levels [13]. One likely reason for this discrepancy may be the result of the age of the subjects mentioned. The reported BMI, sex, and weight ranges, as well as previous studies [33]. It seems that one of the main factors affecting the intensity resistance training may be the case, so that it aligns with the results of this study, high-intensity exercise has caused an increase in adiponectin [7].

Low intensity but caused no change in adiponectin levels.10 weeks of progressive resistance training in favorable lipid profile in obese men, there is a way that the average total cholesterol levels, exercise has been reduced. Also, resistance training causes a decrease in other lipid markers were found, although the changes are not significant [11]. Garekani et al. found that adiponectin was significantly characterized by central obesity and insulin stimulation of glucose uptake due to their correlation. The effects of exercise on serum HMW adiponectin, there are few studies. For example, it has been shown that HMW adiponectin concentration and its ratio to total adiponectin in middle-aged men after 12 weeks of aerobic training and resistance to insulin increases. It was while the effectiveness of a program of aerobic exercise in 3 different effect on adiponectin and its isomers [30].

The research reports indicate that there is a positive relationship between exercise and lipid metabolism and consequently increase adiponectin gene expression [11, 19]. In this regard, Kraemer & Castracane stated amount of adiponectin response exercise can be effective, such as the duration and intensity of exercise are important factors in determining the response of adiponectin [9]. Must be acknowledged that the issue of the effect of exercise on adiponectin in its infancy and there are also many unknown issues about the role of adipose tissue and its relationship with other tissues. The effect of exercise intensity and type of fuel in the tissues [20, 21] and the effect of adiponectin in plasma free fatty acids. one can infer that changes in adiponectin levels after exercise can is related to the intensity and duration of exercise. Although such an approach yet identified any long-term exercise or withdrawal of excess fat under skin surgical adiponectin will increase, it today believes the spent intensity exercise some Connoisseurs the adiponectin there is a relationship Stimulation. also, Kraemer and Castracane, in a review paper to examine the effect of exercise on adiponectin levels, and the stated amount of exercise can be effective adiponectin response, so that a long-term activity with the volume (intensity, duration and frequency) above can effect on adiponectin concentrations and in the meantime, there are important factors as the duration and intensity of exercise training on how to respond to adiponectin [9]. Various researches have been applied in different types of physical activity intensity and duration of the

individual [37]. The investigation shows the shortest duration of exercise along with a diet that could affect the level of adiponectin is two weeks [9]. However, as mentioned earlier, the duration and intensity of exercise that can cause weight loss or body fat loss will play an important role in adiponectin levels.

According to the results of the present study, ginger supplementation and regular physical activity increases adiponectin are markers. It measures the changes in insulin and insulin resistance has developed. It seems that physical activity or taking ginger supplements and especially the combination of the two can be considered as a strategy to reduce or improve inflammation in patients with breast cancer as the primary treatment for drug and supplement used to improve the quality of life.

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