



The effect of selecting aerobics exercise program (walking in water and in land) on HDL-C, LDL-C, TC and TG in non-athlete menopausal women

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ABSTRACT

The purpose of this study was to determine the effect of 6 weeks selecting aerobics exercise program (walking in water and in land) on high density lipoprotein (HDL-C), low density lipoprotein (LDL-C), total cholesterol (TC) and triglyceride (TG) in nonathletic menopausal woman. 36 nonathletic menopausal women aged 45-55 years that were volunteer to participate in the research were randomly assigned to 1 of 3 group (n=12), they were divided in 2 exercise group (walking in water and walking on land) and a control group. Subjects participated in exercises program three sessions per week for 6 week (totally 18 sessions) each lasting 35 minutes at% 50 -% 70 maximum heart rate. Blood samples were taken from the brachial vein before and after the 6-week experimental period. For analyzing data we used independent and depended t test and ANOVA analysis in the significant line of $p < 0/05$. After 6 weeks exercise, HDL-C increased significantly in exercise group and LDL-C, TC and TG shows a significant decrease in both of them. There was no significant difference between the effects of exercise programs in exercise group on HDL-C, LDL-C, and TC. But the walking in land exercise group shows more reduction in LDL-C compared with walking in water group. Control group compared with exercises group did not show any significant changes. These results suggest that menopausal women can use walking programs in water and in land to increase HDL-C or decrease LDL-C, TC and TG.

Key word: Menopause, High density lipoprotein, low density lipoprotein, total cholesterol and triglyceride

INTRODUCTION

Menopausal is a natural period of life for women at the age of 45 to 55 in which the menstrual cycle is interrupted. This status is a response to the reduction of the female hormone estrogen, and its symptoms fallow with hot flashes, osteoporosis and mood changes [1]. Estrogen or the female hormone may prevent vascular damage and help the protection against cardiovascular disease. Estrogen deficiency (in natural menopause or surgical menopausal) is associated with increased cardiovascular risk. For women in menopause mostly on those of with excess weight, total cholesterol, LDL cholesterol (which is been called the bad cholesterol), and triglycerides are increased this happens when the HDL cholesterol (good cholesterol) is reduced [2-3]. As the mortality rate happens to increase because of cardiovascular disease among men and women, overall, for men at the age of 45 while for women after age of 55 is

the time when the risk increases. Generally, the period after menopause shows that the risk for heart disease happen to increase then. Among various factors such as high blood cholesterol which has a major role in the incidence of heart disease the evidence shows that physical activities are associated with reduction of risk for cardiovascular disease and possibly lead to improve quality of lipoproteins.

However, the amount and intensity of exercise required for optimal effect is unknown. But regular physical activity can control many of the annoying symptoms of menopause such as heart disease and osteoporosis [4].

Researchers have shown that women who exercise have milder symptoms than sedentary women. Many studies have shown that exercise and participation in physical activities cause significant changes in lipoprotein, the cholesterol and triglyceride [5].

Life crises such as menopause can affect women's health. Menopause is a turning point in women's lives. Although it is a general physiological process but does not feel equally and all the same with same definition. During this period, some problems rise from the lack of sex hormones, which one of them is cardiovascular risk that they are facing? Menopause not only causes problems also a lot of distress and disability, but is a pressure on the limited resources of the country's health care systems.

Today, changes in longevity and increased life expectancy, makes women spend more years in the period after menopause. Therefore the problems and complications are more tangible and have been under concern form members of the public health community [6].

Various strategies are to reduce the danger of menopause and its effects .one that can be pointed out is the hormone therapy. But it is necessary to know the truth about hormone therapy.on a survey 50% of women were saying that the hormone therapy increased the risk of exposing to cardiac Strokes, brain and breast cancer and all type of cancers. With the health and hygiene level upper the Longevity is increased and women are mostly living through their 80's in western countries also one third of their life in menopause, this matter comes rather important.

Researchers have shown that estrogen causes strong and healthy bones and prevents strokes both heart and brain. After menopause, the protective effects of estrogen in women disappear and it leads to increases of the risk of heart and brain strokes [7].

Although these problems do not always because death, but can cause major disability, so the major aim of this study is to monitor the effect of a selected program which is walking in the water on the quality of life for women. High-density lipoprotein levels, low density lipoprotein, total cholesterol and triglycerides in non-athletes postmenopausal women from 55 to 45 on land can lighten the effect of these exercises and also present these exercises as a program which helps to care cardiovascular disease related to the menopause. The result of this study can be used in trainers program to cause cure in lipoprotein density, triglycerides and total cholesterol and reduce the risks in menopausal women [8].

MATERIALS AND METHODS

Subjects in this study consist of 36 non-athletic women that have been participated voluntary all with no cardiovascular disease record and at least one year was passing from their menopause also they did not have any sort of physical activities in one past year.

Through the objectives of this research, exercises such as walking in water and on land for 6 weeks and 3 sessions per week (18sessions) happened. Walking on land exercise was conducted as following:

Warm-up: First participants were asked to walk slowly with their normal speed for 5 minutes, then pause and stretch (static moves), do stretches and balance exercises focusing on the ankle, thigh and leg muscles this would do the work of flexibility. The level was for 15 to 20 minutes and 30% maximum heart rate for each participant. During the sessions, to control the intensity of exercise on heart rate the following formula were used: $MHR = 220 - \text{age}(20)$. Exercises was monitored and recorded through three stages, start of walking, walking ,and in the middle of the

walk. While walking the radial artery and heart rate monitoring was carried out for 6 seconds. (Subjects were instructed to count the pulse by the researcher).

Exercise, walking in the land: After stretching and start walking with normal speed, walking speed and distance should suit the age and general condition of the subject's body. So that when they are able to talk without shortness of breath when walking then the speed is fast enough. as each person have different capability in different moves so each participant will be measured with the maximum heartbeat rate which is 50to 70 percent of the maximum rate for each that is been recorded by the trainer, and through their abilities they start to walk. Heart beat rate of participant is been controlling continuously. In the third week 1600 meter were crossed in 20 minutes, and each week 400 meters were added and 5 minutes added flowingly. That at the end of 6week the distance crossed was 2800meter in 35 minutes [9].

Cool down: In the last 5 minutes of the walking the participants were asked to shorten their steps to come to the starting speed of warming ,and end their walking with the stretching exercises which remove the muscles from traction and make the heart beat natural.

Exercise, walking in the water: All the same exercises were taken place as the land exercises with the difference that the group did the exercise in the water with all the muscle of lower part that were involve on the land exercise in the pool with 1meter depth .being in the water makes you exercise because every move you make is an opposition to water, surly exercise in water does not mean swimming on the other hand it means doing the same exercises as the land like walking. Exercise in the water will be as beneficial as the exercises on land if they be done correctly. By Exercise in the water and the water resistance of 4 to 44 percent more than air a grater resistance can be experienced. Doing exercise in water is just like exercising with weight s with the difference that it is safer.

Since gravity is low in the water, the water can stretch those who did not work on Land [9]. Walking in the water group did the same exercises like land, with 50 to 70 percent of maximum heart beat rate with 35 min duration.

First the Subjects were examined with a Cardiovascular to be controlled and accepted as a participant on the research, then they divided randomly in to3 groups (two experimental group and one control group).The conditions of tests were explained entirely for the participants and asked them to fill out a testimonial one day before the exercise started for 6 weeks then the controls were made: Control last meal, all the samples to the laboratory for fasting blood sampling to cholesterol, HDL C, LDL C and triglyceride levels were measured by kits specifically. Then with the same uniform, to be the same for every person and preparing the transportation serves for all in whole 6 weeks of exercise the participants started to exercise under the monitor of researcher .After 6weeks the blood test were taken with the same conditions that is been taken at the first place. For analyzing data we used independent and depended t test and ANOVA analysis in the significant line of $p < 0/05$.

RESULTS

Research findings showed that serum LDL-C levels in the water walking exercise program significantly reduces and serum levels of HDL-C significantly increases TC and TG levels also significantly reduced (table 1). The findings showed that subjects with serum LDL-C levels on land walking exercise program significantly reduces (table 2) and serum levels of HDL-C significantly increases. So Significant reduction in TC and TG levels were observed in the group walking on land (table 3) the findings showed that the mean TC, LDL-C and HDL-C, and after walking exercise in the water and the land is not significant and effect of walking in water and land exercises is only after a significant difference in TG levels(table 4).

Table1. Average LDL-C levels compared to the pretest and posttest in the experimental (walking on water) and control groups

Variable	Groups	Test type	Counter	Average	d.f	t	sig
LDL-C levels	Walking in the water	Pretest	12	167.8	11	4.394	0.001
		Posttest	12	138.5			
	Control	pretest	12	146.5	11	-1.221	0.247
		Posttest	12	147.7			
HDL-C levels	Walking in the water	Pretest	12	29.2	11	-3.244	0.008
		Posttest	12	39			
	Control	pretest	12	37.2	11	-0.616	0.551
		Posttest	12	37.2			
TC levels	Walking in the water	Pretest	12	240	11	1.495	0.163
		Posttest	12	221.8			
	Control	pretest	12	225.8	11	-1.332	0.210
		Posttest	12	226.6			
TG levels	Walking in the water	Pretest	12	257.7	11	4.384	0.001
		Posttest	12	202			
	Control	pretest	12	225.8	11	-1.332	0.210
		Posttest	12	226.6			

Table2. Comparison of LDL-C in pretest and posttest in the experimental (walking on land) and controls groups

Variable	Groups	Test type	Counter	Average	d.f	t	sig
LDL-C levels	Walking in the land	Pretest	12	167.8	11	4.394	0.001
		Posttest	12	138.5			
	Control	pretest	12	146.5	11	-1.221	0.247
		Posttest	12	147.7			
HDL-C levels	Walking in the land	Pretest	12	38.66	11	-5.826	0.000
		Posttest	12	50.83			
	Control	pretest	12	37.2	11	-0.616	0.551
		Posttest	12	37.3			
TC levels	Walking in the land	Pretest	12	229	11	2.412	0.034
		Posttest	12	203			
	Control	pretest	12	225.8	11	-1.332	0.210
		Posttest	12	226.6			
TG levels	Walking in the land	Pretest	12	210	11	3.465	0.005
		Posttest	12	146			
	Control	pretest	12	225.8	11	-1.332	0.210
		Posttest	12	226.6			

Table 3. Comparison of mean pre-test experimental group (walking on water and land) in the TC, TG, LDL-C and HDL-C

Variable	Exercise Groups	Average	d.f	t	sig
TC levels	Walking in the water	240	11	-0.562	0.580
	Walking in the land	229			
TG levels	Walking in the water	258	11	-1.383	0.567
	Walking in the land	210			
LDL-C levels	Walking in the water	168	11	-1.520	0.536
	Walking in the land	148			
HDL-C levels	Walking in the water	29	11	1.386	0.197
	Walking in the land	39			

Table 4. Comparison of the experimental test (walking on water and land) rate TC, TG, LDL-C and HDL-C

Variable	Exercise Groups	Average	d.f	t	sig
TC levels	Walking in the water	203.58	22	-1.344	0.193
	Walking in the land	221.83			
TG levels	Walking in the water	146	22	-2.409	0.025
	Walking in the land	202			
LDL-C levels	Walking in the water	126	22	-1.366	0.186
	Walking in the land	138.58			
HDL-C levels	Walking in the water	50.83	22	1.683	0.107
	Walking in the land	39			

DISCUSSION AND CONCLUSION

Previous research comparing the results of this study was to determine the results of the research are consistent with current research while few studies have reached different findings.

The study showed that walking exercise in the land, reduces the amount of high-density lipoprotein, low density lipoprotein, triglycerides and total cholesterol in non-athletic postmenopausal women significantly. The study showed that walking exercise in the land, the amount of high-density lipoprotein, low density lipoprotein, triglycerides and total cholesterol in postmenopausal women significantly reduces non-athletes. The results with the findings of Akbari and et al (2009), Taheri (2007), Alijani (2002), Do valleSales and et al (2010), Ebele and et al (2009), Wooten and et al (2009), Kodama and et al (2007), Mohanaka and et al (2006), Fitzgerald and et al (2006) Jacobs and et al (2006) which represent the aerobic exercise in reducing high-density lipoprotein, low density lipoprotein, triglycerides and total cholesterol role. Similarities between results may be a cause of similarity between training, exercise, practice type, number and nature of the training.

Kelley and et al (2004) study the impact of an aerobic exercise and lipid and lipoprotein in women, a randomized controlled study conducted multiple. This study used multiple methods to examine the effects of aerobic exercise on lipids and lipoprotein in women. Studies of research articles by searching the computer, browse the list of resources, China's newspapers and expert review of reference lists were gathered. And the amount of studies gathered in English between the 1955 to 2003 was limited and in them most were considering aerobic exercise for women's in 50 or more. One or more of the lipid and lipoprotein were evaluated.

Total cholesterol, and high density cholesterol) LDL C, low density cholesterol (LDL C) tedious triglyceride (TG) were Results: Using a random effects model, significant improvement was observed in all lipid and lipoprotein. Reduced to approximately 2%, 3% and 5% respectively for, LDL, TC and TG was observed while increasing the HDL C was 3%. Conclusion: Aerobic exercise for increasing HDL C and TC and LDL C reduction is effective in women. The study also is consistent with recent research results.

In Kelley study (2009) with improved endurance training effects on blood lipid content in women after menopause the aim was to evaluate the effects on blood lipid content and Progressive resistance exercises. Resistance during 24 weeks of advanced training programs concluded that there was not a positive effect on blood lipid profiles in postmenopausal women. Marcus and colleagues (2009) research and training under the influence of resistance exercise on lipid profile of older women. This study compared the effects of 8-month program on blood lipids in elderly women. Significant changes in lipid profile after 8 months of training, resistance training group showed that these findings are inconsistent with the research. The reasons are not consistent with the type of exercise used (resistance training).

Sharifi (2007) study as the effects of aerobic exercise (walking on water) on blood lipids in women. The purpose of this study is assessing the impact of aerobic exercise (walking on water) on lipid and lipoprotein in women after menopause. The result showed that after 10weeks of training there was a significant reduction of Triglycerides, cholesterol, low density lipoprotein and a significant rise for the high density lipoprotein. As a result it could be said that the aerobic exercises are considered rather proper way to reduce cardiovascular disease in menopause women The results of this study is consistent with the study, probably due to the nature and circumstances of the same type of exercises and examples (menopause)

Konstantin and et al (2007) made a research on the effect of inside water exercise and land exercises and their relation with coronary and the cholesterol and the preparation of body, after 4 month Exercise, body weight and total fat in both groups was lower than the control group Patients who were trained in water during exercise and muscle strength compared to a form of land improved, Total cholesterol and triglyceride levels significantly decreased for both training and control groups. This research's result is similar to this study which can be a result of similarities between type and nature of exercise.

Cox and et al (2010) studied as compared with the swimming and walking on body weight, fat distribution, lipids, glucose and insulin in sedentary older women, Fat in both groups did not differ much With walking, swimming, body weight, leading to reduced total cholesterol and low density lipoprotein was reduced too. Compared with

walking, swimming, body weight, body fat distribution and insulin in the short term and long-term weight and body fat measurements improved. These results suggest that exercise affects health, The results of the impact of physical activity and lipoprotein cholesterol in the present study is consistent and The impact of these factors on the activity in dry and inconsistent, is possibly due to the nature of activities (swimming).

Izumi and colleagues (2001) study as the effects of swimming exercise on aerobic capacity and the volume of plasma lipids and lipoproteins in postmenopausal women, This study evaluated the effects of long-term swimming training on aerobic capacity and blood lipids and lipoproteins in postmenopausal women was the volume, Following two years of practice, changes didn't happen in the concentrations of total cholesterol, HDL C, LDL C and TG in the exercise group. The result of this study is not inconsistent with the present study and it may be a result of the nature and type of water exercises and its research factors.

Much of the past and present researches shows the positive effects of aerobic training on land and water and recommends it to those who are looking to be healthy. Researchers have shown that exercise on water can be a beneficial way to reduce the risk of cardiovascular disease and have a positive effect on people's health. Considering that in our country, few studies have been done in this field. There is still need to do and to support studies in this field.

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