IJBPAS, July, 2015, 4(7): 4596-4610

ISSN: 2277–4998

International Journal of Biology, Pharmacy and Allied Sciences (IJBPAS)

'A Bridge Between Laboratory and Reader'

www.ijbpas.com

STUDY ON EFFECTS OF ENDERMOLOGIE, ULTRASOUND WAVE AND AEROBIC TRAINING ON SERUM LIPID PROFILE AMONG OBESE FEMALE NONE ATHLETES

HASSAN MATINHOMAEE[1*], SAEIDE NIKAKHTAR[1]

1: Department of Exercise Physiology, Faculty of Physical Education and Sports Sciences, Islamic Azad University, Central Tehran Branch, Tehran, Iran

***Corresponding Author: E Mail: hasanmatinhomaee@yahoo.com; Ph.: +98 9123680810**

ABSTRACT

The purpose of this research is setting and comparing the effect of 8-week high intensity interval training (HIIT), LPG massage, cavitation, and their combination on the profile of the lipid of serum of women who are non-athletic and overweight.

Purposefully, 50 non-athletic overweight women, age of 25 to 30, were randomly chosen and equally put in five groups: LPG massage, cavitation, intensive alternative exercise, and the combination of LPG massage- cavitation -intensive alternative exercise, control. Before and after eight weeks intervention, blood samples were taken from all subjects, and also the other measurements were done. The method of analytic variance with frequent measuring was used to compare the changes in all five groups.

Results showed that after 8 weeks intervention by LPG massage, cavitation, and intensive alternative exercise, LPG massage had the best effect on BMI, WHR (the percentage of body fat), HDL and intensive alternative exercise had the best effect on variables of cholesterol, Triglyceride, LDL, and VLDL.

Needless to say that it is not easy to come to a definite conclusion with only one research. Repeating the same research in different circumstances using more subjects can help us to achieve more precise results in the future.

Key Words: Profile of Lipid, High Intensity Interval Training, LPG Massage, Cavitation, Weight loss

INTRODUCTION

In the whole world, obesity is unbelievably spreading, and statistics show that around 70% of adult Americans are either obese or overweight. Moreover, the childhood obesity is increasing even faster which shows that this epidemic disease is not going to be cured in the near future. High triglyceride with low HDL, high LDL causes obesity and diabetes, and their high level is harmful for the body and accelerates the process of sclerosis Artery. These days many women try to get in shape by losing weight in many ways, some of which are doing exercises, different massages and position exercises **[1]**.

LPG has been improving since 1970s, and a lot of researches have been done about it. Increasing the circulating of blood and lymph is one of its effects which leads to improvement and relocation of solid fat cells which helps to reduce the fat sources **[2]**.

Cavitations are a machine which works with ultra sound rays whose function is curing one area's fatness and cellulite. This machine starts with making a so-called sound wall. This ray enters the tissue under the skin, and by breaking the sound wall, it produces heat and movement and damage the membranes adipose cells. High intensity interval training (HIIT) is a way of exercise which is clarified by reduction of the time of exercise and increase of its intensity. It has been mentioned in recent reports that HIIT results in a decrease in body fat, resistance to insulin, and adaptation of most muscles with the exercise **[3].**

It also increases the strength of aerobic and anaerobic, and in general, physical preparation. Perhaps, the combination of the ways mentioned can have deeper effect, although, years ago, different methods of physical activities were used to lose weight. Today, using physical activities on a special part of the body such as different kinds of massages are so common among women **[4]**.

In recent years, most women used special physical activities on one part of their bodies to get in shape and stay healthy. Also long aerobic exercises can be replaced with short high intensity interval training because they are not time consuming. LPG massage and cavitations have the same factor as intensive alternative exercise too. So, it is important to give overweight women some functional and scientific advice. This advice is more important now because it is the first time that a research has been done to show the effect of combination of cavitations, LPG, and HIIT at the same time **[5]**.

The purpose of this research is setting and comparing the effect of 8-week High intensity

interval training (HIIT), LPG massage, cavitations, and their combination on the profile of the lipid of serum of women who are non-athletic and overweight.

SUBJECTS AND METHODS

Subjects

This research includes all non-athletic, overweight women (BMI 25 or more), and between the ages of 25 to 30, in Tehran volunteered to participate in the research. The subjects were more non-smokers and healthy with no operation record, which were needed factors.

The subjects were chosen purposefully as a sample and after registering their written consent randomly put in five 10-sample groups: LPG Massage, Cavitation, High Intensity Interval Training, combination of those three, and control. All subjects were completely healthy according to the doctor's confirmation.

The researcher equalized all the subjects (except the heredity ones) to reduce the influence of independent variables as much as possible. The description of subjects' characteristics is given in **Table 1**.

Table 1: The Mean and standard deviation of subjects' traits

group	weight	High	Age
Lpg massage	**160.60±3.27**	**63.00±5.94**	**1.60±27.90**
cavitation	**165.65±7.71**	**67.86±7.52**	**29.20±2.35**
HIIT	**161.10±7.89**	**67.54±5.58**	**29.40±1.26**
combination	**154.73±27.24**	**68.95±9.28**	**29.60±3.72**
control	**161.20±2.04**	**70.70±6.62**	**29.40±2.17**

Intervention Training Program

The first group had LPG massage on their stomachs and hips for 8 weeks. The second group used cavitation on their stomachs and hips once a week for 8 weeks. The third group used the method of High Interval Intensity Training three times a week for 8 weeks. The forth group had LPG massage and High intensity interval training three times a week and cavitation once a week for 8 weeks. The last group called control didn't get any intervention. All subjects started and finished all interventions and sample taking sessions at his or her special time which was the same for all his or her training sessions.

High Intensity Interval Training

Before training, the oxygen measurement test was taken from all subjects. Subjects run for 1.5 miles and were timed with a chronometer and put in the following formula. So, the training intensity of 85 to 90 percent of heart rate was allocated to subjects. Subjects' training program started with seven-minute aerobic activity to warm up. Then they were given some dynamic stretching movements. The main program included a 2-minute dash

with the intensity of 85 to 90 percent of maximum heart rate for 6 times. The overload was measured according to the level of body's compatibility of each subject. The main program and cooling down took 36 and 10 minutes respectively. The total time of the train was 60 minutes.

LPG Massage

The main program of "Roll in" was chosen for the subjects working with LPG. The massage was given by experts in lipo massage. A 35-minute massage was given to each subject. The maneuvers used on the tissue included bounce, rock, bounce and swing, and the movements were radar, longitude and transversal.

Cavitation

For all the subjects using cavitation, the scale of the sweep machine was from 8 to 12 and the power was maximum 77. It took 40 minutes and was done once a week.

The method of measuring the variables

Before and after the 8 week interval, a blood test was taken from all the subjects, and other measurements and tests were done. All stages of testing were done under the same circumstances for each one of the subjects. After a 12-hour starvation (between 7:30 to 8:00 in the morning.), 5cc blood was taken from the subject' vein. Another 5cc blood was taken from the subjects' Basilic vein.

The collected samples were kept in sterile tubes containing K3 EDTR. Heparinized tube and EDTR were put in ice and were kept in the temperature of the environment for some minutes. Then the serum was separated from plasma by a centrifuge with the velocity of 3500 RPM. All blood samples were frozen and kept in -20 centigrade, and they were used in the laboratory testing time. The levels of cholesterol, triglyceride, LDL and HDL using clonometric method and kit Biorox were measured for each sample. Also, VLDL was measured using the amount of HDL, LDL and cholesterol. Along with blood taking, body mass index (BMI) and percent body fat (PBF) were measured with body composition machine.

Statistic Method

First of all, the amount of each variable was described using the average and test deviance. In this research, in order to study the natural distribution and parametric and non-parametric tests, Smirnof-Kolmogroof test was used. Because all data had the natural distribution, in order to study the variables' changes in all 5 groups Interval variance analysis with frequent measurement was used. For all statistical tests, a meaningful level equal to 0.05 was assigned. Also, to make the calculations SPSS a statistical spot wave, version 19, was used.

RESULTS

The variables' average and test deviance, before and after intervention in 5 study groups, are show in table 2. Also, internal variance analyses with frequent measurement are summarized in table 3 to compare the changes in all 5 groups.

Regardless of the group, the factor of time didn't have any meaningful effects on body mass index (BMI) of the women who were non-athletic and overweight (p=0.783). The factor of group (LPG Massage, High intensity interval training (HIIT), Cavitation, the combination of LPG Massage- HIIT-Cavitation, and Group) didn't have any meaningful effects on body mass index (BMI)(p=0.984). The interaction of the factors of time (before and after 8 weeks) and group (LPG Massage, High intensity interval training (HIIT), Cavitation, the combination of LPG Massage- HIIT- Cavitation, and Group) had a meaningful effect on body mass index (BMI) (p=0.000). The total statistical analyses showed that although the factor of time and group separately didn't influence on subjects' BMI, the interaction of them were meaningful which showed that LPG Massage had did the deepest effect.

Regardless of the group, the factor of time (before and after 4) does not have a meaningful effect on the amount of WHR of the women who are non-athletic and overweight (p=0.210). The results of variance analysis on the amount of WHR shows that the factor of group (LPG Massage, High intensity interval training (HIIT), Cavitation, the combination of LPG Massage- HIIT-Cavitation, and Group) has a meaningful effect on WHR (P=0.000). To determine the place of difference, Tuki test was used. The results showed that the amount of WHR between the LPG massage and cavitation group (p=0.001) and between cavitation group and the central group (p=0.001) has a meaningful difference. The interaction between the factor of group (LPG Massage, High intensity interval training (HIIT), Cavitation, the combination of LPG Massage-HIIT- Cavitation, and Group) and the factor of time (before and after 8 weeks) has a meaningful effect on WHR (P=0.000). The total statistical analyses showed that the factor of group and the interaction of the factor of group and time resulted in a decrease in WHR in non-athletic overweight women, but in comparison with the other groups LPG Massage had the deepest effect.

Regardless of the group, the factor of time (before and after 4) doesn't have any meaningful effect on the amount of the whole body fat of the women who are non-athletic and overweight (p=0.161). The factor of

group has a meaningful effect on the whole body fat (p=0.003). To determine the location of difference, Tuki test was used. The results showed that the amount of the whole body fat between the LPG Massage group and the HIIT group (p=0.018) and between the cavitation group and the HIIT group (p=0.023) had a significant difference. The interaction between the factor of group (LPG Massage, High intensity interval training (HIIT), Cavitation, the combination of LPG Massage- HIIT- Cavitation, and Group) and time (before and after 8 weeks) doesn't have a significant effect on the whole body fat (p=0.090). The total statistical analyses showed that only the factor of group has a significant effect on the whole body fat, and the effect of time of measurement and the interaction between time and group is not significant. Regardless of the group, the factor of time (before and after 4) has a significant effect on the amount of cholesterol's density of women who were non-athletic and overweight (p=0.001).

The factor of group (LPG Massage, High intensity interval training (HIIT), Cavitation, the combination of LPG Massage- HIIT- Cavitation, and Group) has a significant effect on cholesterol's density (p=0.000). To determine the location of difference, Tuki test was used. It showed that the amount of cholesterol between the LPG Massage group and cavitation group (p=0.005), intensity interval training (HIIT) (p=0.000), the group of combination of LPG Massage- HIIT- Cavitation (P=0.000) and the control group has a significant difference. The interaction between the factor of group (LPG Massage, High intensity interval training (HIIT), Cavitation, the combination of LPG Massage- HIIT- Cavitation, and Group) and time (before and after 8 weeks) has a significant effect on cholesterol density (p=0.001). The total statistical analyses showed that the factor of group, time and their combination resulted in a decrease in the cholesterol's density of women who are non-athletic and overweight, but intensity interval training has the deepest effect.

Regardless of the group, the factor of time has a significant effect on amount of Triglyceride of women who are non-athletic and overweight (p=0.000). The factor of group (LPG Massage, High intensity interval training (HIIT), Cavitation, the combination of LPG Massage- HIIT- Cavitation, and Group) has a significant effect on Triglyceride (p=0.001). To determine the location of difference, Tuki test was used. It showed that there is a significant difference in the amount Triglyceride between the LPG group and intensity interval training group

(p=0.000) and between the cavitation group and the intensity interval training group (p=0.022). The interaction between the factor of group (LPG Massage, High intensity interval training (HIIT), Cavitation, the combination of LPG Massage- HIIT-Cavitation, and Group) and time (before and after 8 weeks) doesn't have a significant effect on triglyceride (p=0.127). The total statistical analysis show that although the factor of time and group separately are significant interaction between they aren't.

Regardless of the group, the factor of time (before and after 4) has a significant effect on the amount of LDL of women who are non-athletic and overweight (p=0.000). The factor of group (LPG Massage, High intensity interval training (HIIT), Cavitation, the combination of LPG Massage- HIIT-Cavitation, and Group) has a significant effect on LDL (p=0.004). To determine the location of difference, Tuki test was used. It showed that the amount of LDL between the HIIT group and the control group (p=0.007) and between the combination of the LPG Massage group, the Cavitation group, High intensity interval training group and the control group (p=0.009) has a significant difference. The interaction between the factor of group (LPG Massage, High intensity interval training (HIIT), Cavitation, the combination of LPG Massage- HIIT- Cavitation, and Group) and time (before and after8 weeks) has a significant effect on LDL (p=0.000). The total statistical analysis showed that not only the factor of group and time separately, but also the combination of them results in a decrease in the density of LDL of women who are non-athletic and overweight but High intensity interval training (HIIT) has the deepest effect.

Regardless of the group, the factor of time (before and after 4) had a significant effect on the amount of HDL of women who are non-athletic and over weight (p=0.000). The factor of group (LPG Massage, High intensity interval training (HIIT), Cavitation, the combination of LPG Massage- HIIT-Cavitation, and Group) had a significant effect on HDL (p=0.000). To determine the location of difference, Tuki test was used. It showed that there is a significant difference between LPG Massage and the cavitation group (p=0.000), the intensity interval training group (p=0.000), the combination of LPG Massage, Cavitation and HIIT (p=0.000) and the control group. The interaction of the factor of group (LPG Massage, High intensity interval training (HIIT), Cavitation, the combination of LPG Massage- HIIT-Cavitation, and Group) and time (before and after 8 weeks) has a significant effect on HDL (p=0.000). The total statistical analysis

showed that not only the factor of group and time, but also the combination of them results in a decrease in the density of HDL of women who are non-athletic and overweight. But the cavitation group's effect was more than other groups'.

Regardless of the factor of group, the factor of time (before and after 4) has a significant effect on the amount of VLDL of women who are non-athletic and over weight (p=0.000). The factor of group (LPG Massage, High intensity interval training (HIIT), Cavitation, the combination of LPG Massage- HIIT- Cavitation, and Group) has a significant effect on VLDL (p=0.000). To determine the location of difference, Tuki test was used. It showed that there is a significant difference between the LPG massage and the HIIT group (p=0.022). The interaction of the factor of group (LPG Massage, High intensity interval training (HIIT), Cavitation, the combination of LPG Massage- HIIT- Cavitation, and Group) and time (before and after 8 weeks) doesn't have a significant effect on VLDL (p=0.127). The total statistical analysis showed that although the factor of group and time are both significant, the interaction of the factors of group and time doesn't have a significant effect on VLDL of women who are non-athletic and overweight.

Table 2: The mean and standard deviation of study variables in 5 groups and in the time of both before and after intervention

Variant	Time	Control	Combination	HIIT	Cavitation	Lpg massage
BMI	**after**	**25.26±2.14**	**25.92±4.15**	**25.45±4.99**	**24.72±2.53**	**26.54±3.19**
	before	**25.02±1.86**	**25.74±3.66**	**25.92±4.85**	**26.84±3.85**	**23.95±1.89**
WHR	**after**	**0.73±0.04**	**0.78±0.06**	**0.75±0.04**	**0.81±0.05**	**0.74±0.02**
	before	**0.73±0.03**	**0.77±0.06**	**0.78±0.02**	**0.81±0.06**	**0.73±0.01**
PBF	**after**	**34.16±2.57**	**33.36±3.79**	**34.90±4.82**	**27.22±8.66**	**27.57±7.60**
	before	**34.78±3.39**	**33.62±2.28**	**36.38±4.97**	**27.51±8.69**	**26.73±7.63**
Cholesterol	**after**	**173.00±9.46**	**184.68±16.99**	**192.16±16.20**	**179.61±15.59**	**153.83±8.07**
	before	**172.46±11.70**	**185.05±18.18**	**184.04±16.00**	**173.59±16.15**	**154.05±6.61**
TG	**after**	**143.90±52.89**	**145.40±7.66**	**182.30±16.53**	**133.30±43.62**	**112.30±31.62**
	before	**141.70±50.94**	**143.40±9.17**	**179.40±15.96**	**131.30±41.98**	**112.70±32.16**
LDL	**after**	**88.90±7.76**	**99.00±9.42**	**100.39±7.42**	**95.78±4.65**	**92.87±3.22**
	before	**87.36±7.79**	**98.75±9.33**	**97.95±7.52**	**92.87±4.71**	**92.64±3.35**
HDL	**after**	**55.29±3.27**	**56.63±8.76**	**55.17±9.48**	**57.14±6.05**	**38.43±4.60**
	before	**52.17±2.52**	**54.08±10.41**	**53.14±10.15**	**54.04±5.68**	**40.13±4.75**
VLDL	**after**	**28.78±1.58**	**29.08±1.53**	**36.46±3.31**	**26.66±8.72**	**22.46±6.32**
	before	**28.34±10.19**	**28.68±1.83**	**35.88±3.19**	**26.26±8.40**	**22.54±6.43**

Table 3: Evaluation of analysis of variance in repeated measures for

variables	Factor	Effect Size	P-value	F	df
BMI	**Time**	**0.002**	**0.783**	**0.077**	**1**
	Group	**0.008**	**0.984**	**0.093**	**4**
	Interaction of time×group	**0.358**	***0.000**	**6.26**	**4**
WHR	**Time**	**0.035**	**0.210**	**1.61**	**1**

	Group	**0.363**	***0.000**	**6.42**	**4**
	Interaction time×group	**0.354**	***0.000**	**6.15**	**4**
PBF	**Time**	**0.043**	**0.161**	**2.02**	**1**
	Group	**0.298**	***0.003**	**4.78**	**4**
	Interaction time×group	**0.160**	**0.090**	**2.14**	**4**
cholesterol	**Time**	**0.236**	***0.001**	**13.86**	**1**
	Group	**0.456**	***0.000**	**9.44**	**4**
	Interaction time×group	**0.328**	***0.001**	**5.49**	**4**
TG	**Time**	**0.290**	***0.000**	**75.69**	**1**
	Group	**0.319**	***0.001**	**5.27**	**4**
	Interaction time×group	**0.145**	**0.127**	**1.90**	**4**
LDL	**Time**	**0.426**	***0.000**	**33.45**	**1**
	Group	**0.286**	***0.004**	**4.51**	**4**
	Interaction time×group	**0.376**	***0.000**	**6.76**	**4**
HDL	**Time**	**0.511**	***0.000**	**46.95**	**1**
	Group	**0.462**	***0.000**	**9.66**	**4**
	Interaction time×group	**0.507**	***0.000**	**11.55**	**4**
VLDL	**Time**	**0.290**	***0.000**	**18.36**	**1**
	Group	**0.319**	***0.001**	**5.27**	**4**
	Interaction time×group	**0.145**	**0.127**	**1.90**	**4**

* ***Level of significantly P≤0.05***

DISCUSSION

According to the current research's findings, although the factor of time and group separately didn't show any significant differences in groups BMI, the interaction of them was significant, which shows that LPG massage has the deepest effect comparing to other methods. According to the current research's findings, the factor of group and the interaction of the factors of group and time results in a decrease in WHR of women who are non-athletic and over-weight, but LPG massage had the deepest effect comparing to other groups. The previous findings suggested that WHR was an important index in predicting coronary vessels diseases **[5,6,7,8,9].**

Some previous studies about specifying obesity indices recreated to cardiac diseases indicated that there is a stronger relationship between the size of the waist and buttock (WHR) in predicting cardiac diseases **[10,11]** comparing to BMI and other body measurement indices. Perhaps, LPG massage has the biggest effect on BMI and WHR, but due to insignificant previous findings, we cannot reach a right conclusion before doing more researches. However, the present

findings show that LPG massage has the biggest effect on body mass and the proportion of the size of waist and buttock of women who are non-athletic and overweight. Also, according to the present findings, only the factor of group and time were meaningless. In this field, the effect of LPG massage was bigger. Also, according to the current research's findings, both the factor of time and group and the interaction of the factors of group and time result in a decrease in the density of cholesterol of women who are non-athletic and over-weight. But the effect of high intensity interval training (HIIT) was more than other groups. Also, according to the current research's findings, although the factor of time and group separately were specific, the interaction of them was non-specific. We can say that high intensity interval training (HIIT) had the best decreasing effect on triglyceride of serum.

Also, according to the current research's findings, both the factor of time and group and the interaction of the factors of group and time result in a decrease in the density of LDL in the women who are non-athletic and over-weight. But the effect of high intensity interval training (HIIT) was more than others. Also, according to the current research's findings, both the factor of time and group and the interaction of the factors of group and time result in a decrease in the density of HDL in women who are non-athletic and over-weight. But the effect of the group of cavitation was more than other groups. However, this effect was subtractive, so it was not desirable. The best effect on HDL was related to LPG massage which was non-specific of course. Also, according to the current research's findings, although both the factor of time and the factor of group are specific, the interaction of the factors of time and group on the density of VLDL of women who are non-athletic and over-weight did not have a specific effect. Lipids and lipo proteins of the blood are the main causes of cardiac vessel diseases, but they weren't studied enough with the current protocol. It is said that enduring exercises can affect the lipid profile of blood fat through changing the enzymes' activities between vessels.

The results of sport studies on blood fat are not alike. Almost half of the reports proved the positive effect of doing exercises on fats, but the other reports proved the reverse results or without any change **[12,13]** The response of blood fat to one-session physical activity was reported in many studies, which shows a decrease in TC, LDL, TG and an increase in HDL. Few studies were carried out about the effect of high intensity interval training (HIIT) on hematologic variables. The results

of Zigula's studies (1990) shows that regular enduring exercises results in changes in blood combinations **[14].**

Previous findings showed that high intensity interval training (HIIT) results in an improvement in the capacity of both aerobic and anaerobic systems **[15,16,17,18]** Therefore, by developing aerobic and anaerobic systems, these exercises play a special role in changes of Lipid profile of blood. Researchers believe that the Lipid profile of blood (LDL-C, TG ،HDL-C) is affected by the volume of exercise specially the intensity of exercise. Perhaps, the time and intensity of exercises are the reasons of these results. The preliminary levels of these indices at the beginning of the exercises are also an effective element in that the higher Lipids of blood are, the more significant the changes are **[24].**

One of the effects of LPG is an increase in the movement of lymph and blood circulation. Another effect of LPG is moving compact fat cells a little which helps to increase the movement of blood and lymph circulation through thick fat, which decreases the fat **[3].** In the current research, LPG massage had the deepest effect on WHR, BMI, the percentage of the whole body fat and HDL. However, the previous findings about this issue are not enough and more studies must be done. Cavitation works with ultrasound waves, and one of its functions is treating local fatness a celloholit. This equipment starts with making a so-called sound wall. This wave enters the subsequent tissue and breaks the sound wall, which produces heat and movements and damages the membrane cells of adipose. Of course, in the current research, the desirable effects of cavitation were not as good as LPG massage and High Intensity Interval Training (HIIT). However, we must be careful to analyze them because there are a lot of data which are not available in research literature, and more studies must still be done.

HIIT is defined as an interval exercise in which the intensity of the stages of activity is more than 100% maximum used oxygen. HIIT can decrease the body fat and improve Lipid profile of serum. In an 8-week study, HIIT program decreased 3.5 CMs waist, 1.2 KMs stomach fat, .6 KMs under-skin fat and BMI **[25].** There are a lot of unidentified details about these exercises which needs more researches. But in the current research High Intensity Interval Training (HIIT) has the deepest effect on cholesterol, Triglyceride, LDL, and VLDL. In general, in spite of the researcher's supreme effort, there were not any researches about the effect of LPG massage, Cavitation, High Intensity Interval Training (HIIT) and the combination of them

on mentioned variables, and it can be the first research about this issue in the world. So, we should be careful to analyze the data. But from the current research, the effect of LPG massage and High Intensity Interval Training (HIIT) was confirmed. In fact, LPG massage had the best effect on BMI, WHR, the percentage of body fat and HDL.

On the other hand, High Intensity Interval Training (HIIT) had the best effect on cholesterol, Triglyceride, LDL, and VLDL. Perhaps, LPG massage has the deepest effect on body composition, and High Intensity Interval Training (HIIT) has the deepest effect on physiologic and haematologic variables. However, the current findings, from quantity point of view, are not enough to let us draw a precise conclusion in current circumstances. Yet, more studies need to be done about this issue in order to clarify the present ambiguities and reach more exact results. Obviously, this vast research field needs further and more precise information in the future.

CONCLUSION

According to current findings, we can conclude that after 8 weeks intervention by LPG Massage, Cavitation, High intensity interval training (HIIT), and the combination of the mentioned methods, LPG Massage ha the best effect on BMI, WHR, HDL, and the percentage of body fat, and High intensity interval training (HIIT) had the best effect on variables of Cholesterol, Trigrisirid, LDL and VLDL. Since the previous findings were inconsiderable, and before the current research, a similar research was not done, and if it had been done, it was not available for the researcher, this could be the first research which is done in this field. Needless to say that it is not logical to come to a conclusion based on just one research. Repeating similar researches in different situations with more samples can help to get more accurate results in the future. Therefore, in order to reach a precise conclusion and give a clear statement, more researches most be done. The previous researches were concentrated on different methods of aerobic exercises. The effects of high intensity aerobic exercises in short periods of time were not clarified enough.

Pouglisi et al (2008) reported a significant improvement in the Lipid profile of blood (LDL-C, HDL-C, TG) due to sport exercises **[19].** Also, Kuang et al (2005) reported a significant improvement in the Lipid profile of blood (LDL-C, HDL-C, TG) due to sport exercises **[20].** Moreover, Louk et al (2003) reported a significant improvement in the Lipid profile of blood (LDL-C, HDL-C, TG) due to sport exercises **[21].** On the contrary, Olson and his colleagues (2007) reported an

insignificant improvement in the Lipid profile of blood (LDL-C, HDL-C, TG) due to sport exercises **[22].** Also, Cristous et al (2009) reported an insignificant improvement in the Lipid profile of blood (LDL-C, HDL-C, TG) due to sport exercises **[23].** Moreover, Mening et al (1991) reported an insignificant improvement in the Lipid profile of blood (LDL-C, HDL-C, TG) due to sport exercises [24].

ACKNOWLEDGMENT

Without great and generous support of Narenjestan wellness center, it would not be possible to write this article.

REFERENCES

[1] Flegal KM; Carroll MD; Ogden CL; Johnson CL. 2002. Prevalence and trends in obesity among US adults, 1999–2000. JAMA, 288: 1723-1727.

[2] Ogden CL; Carroll MD; Flegal KM. 2003. Epidemiologic trends in overweight and obesity. Endocrinol Metab Clin North Am, 32: 741–760, vii.

[3] Akçakoyun F**.** 2010. Changes in serum lipid profile following moderate exercise school of physical education and sports Mugla University African. Journal of pharmacy and pharmacology, 4(11): 829-833.

[4] Boutcher SH. 2011. High intensity intermittent exercise and fat loss. Stephen H. Boutcher .journal of obesity. Journal of Obesity, 2011: 10.

[5] Barzi F; Woodward M; Czernichow S; Lee CM; Kang JH; Janus E; et al. 2010. The discrimination of dyslipidaemia using anthropometric measures in ethnically diverse populations of the Asia-Pacific Region: the Obesity in Asia Collaboration. Obes Rev, 11: 127-36.

[6] Page JH; Rexrode KM; Hu F; Albert CM; Chae CU; Manson JE. 2009. Waist-height ratio as a predictor of coronary heart disease among women. Epidemiology, 20: 361-6.

[7] Canoy D; Boekholdt SM; Wareham N; Luben R; Welch A; Bingham S; et al. 2007. Body fat distribution and risk of coronary heart disease in men and women in the European Prospective Investigation Into Cancer and Nutrition in Norfolk cohort: a population-based prospective study. Circulation, 116: 2933-43.

[8] Gelber RP; Gaziano JM; Orav EJ; Manson JE; Buring JE; Kurth T. 2008. Measures of obesity and cardiovascular risk among men and women. J Am Coll Cardiol, 52: 605-15.

[9] Lin WY; Lee LT; Chen CY; Lo H; Hsia HH; Liu IL; et al. 2002. Optimal

cut-off values for obesity: using simple anthropometric indices to predict cardiovascular risk factors in Taiwan. Int J Obes Relat Metab Disord, 26: 1232-8.

[10] Hara M; Saitou E; Iwata F; Okada T; Harada K. 2002. Waistto- height ratio is the best predictor of cardiovascular disease risk factors in Japanese schoolchildren. J Atheroscler Thromb, 9: 127-32.

[11] Hsieh SD; Muto T. 2005. The superiority of waist-to-height ratio as an anthropometric index to evaluate clustering of coronary risk factors among non-obese men and women. Prev Med, 40: 216-20.

[12] Boostani MA; Javanmardi R; Boostani MH; Rezaei, A, Hosseini E. 2011. Effect of a single session exercise done twice a day on plasma lipids, lipoproteins, immunoglobulin and cortisol in elite karatekas. J of Martial Arts Anthropology, 11 (3): 42-6.

[13] Weise SD; Grandjean PW; Rohack JJ; Womack JW; Crouse SF. 2005. Acute changes in blood lipids and enzymes in postmenopausal women after exercise. J Appl Physiol, 99 (2): 609-15.

[14] Szygula Z. 1990. Erythrocyte system under the influence of physical exercise and training. Sports Medicine, 10(3):181-197.

[15] Linossier MT; Denis C; Dormois D; Geyssant A; Lacour JR. 1993. Ergometric and metabolic adaptation to a 5-s sprint training programmed. European Journal of Applied Physiology and Occupational Physiology; 67(5): 408-414.

[16] Rodas G; Ventura JL; Cadefau JA; Cusso R; Parra J. 2000. A short training programmed for the rapid improvement of both aerobic and anaerobic metabolism. European Journal of Applied Physiology, 82(5-6): 480-486.

[17] Gibala MJ; Little JP; Essen MV; Wilkin GP; Burgomaster KA; Safdar A; et al. 2006. Short term sprint interval versus traditional endurance training: similar initial adaptations in human skeletal muscle and exercise performance. The Journal of Physiology; 575(Pt 3): 901-911.

[18] MacDougall JD; Hicks AL; MacDonald JR; McKelvie RS; Green HJ; Smith KM. 1998. Muscle performance and enzymatic adaptations to sprint interval training. Journal of Applied Physiology, 84(6):2138–2142.

[19] Puglisi MJ; Vaishnav U; Shrestha S; Torres-Gonzalez M; Wood RJ; Volek

JS; et al. 2008. Raisins and additional walking have distinct effects on plasma lipids and inflammatory cytokines. Lipids in Health and Disease, 7: 14.

[20] kwang k; seung h; michael jq. 2005. Inflammatory markers and the metabolic syndrome. Journal of the American college of cardiology, 46(11): 49.

[21] Luc G; Arveiler D; Evans A; Amouyel P; Ferrieres J; Bard JM; et al. 2003. Prime study group: circulating soluble adhesion molecules ICAM-1 and VCAM-1 and incident coronary heart disease: the PRIME Study. Atherosclerosis, 170: 169-76

[22] Olson TP; Dengel DR; Leon AS; Schmitz KH. 2007. Changes in inflammatory biomarkers following one-year of moderate resistance training in overweight women. International Journal of Obesity, 31: 996-1003.

[23] Christos Z; Tokmak idis S; Volaklis K; Kotsa K; Touvra A; Douda E; Yovos I. 2009. Lipoprotein proWle, glycemic control and physical Wetness after strength and aerobic training in postmenopausal women with type 2 diabetes. European Journal of Applied Physiology, 106: 901-907.

[24] Manning JM; Dooly-Manning CR; White K; Kampa I; Silas S; Kesselhaut M; Ruoff M. 1991. Effects of a resistive training program on lipoprotein--lipid levels in obese women. Medicine and Science in Sport and Exercise, 23(11):1222-6.

[25] Trump ME; Heigenhauser GJF; Putman CT; Spriet LL. 1996. Importance of muscle phosphocratine during intermittent maximal cycling. Journal of Applied physiologies, 80(5):1574-80.