

Effect of eight weeks endurance exercise on liver enzymes in stopping drug women with methadone

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ABSTRACT

Previous studies indicated that endurance exercise decreases levels of liver enzymes. The aim of this study was to determine the effect of endurance exercise on liver enzymes in eight weeks in Iranian women who are stopping the drug with methadone. sixty Iranian women prisoners including 30 cases as experimental group and 30 volunteers served as control. The mean age, height, weight, percent of BF, BMI and vo^2max of experimental group was 33/8 years, 162/2 cm, 62/2 kg, 33/10, 24/22 and 16/18 ml/kg respectively. Experimental group was should run with 65% vo^2max for 2 weeks (3 sessions in a week and for 25 minutes), with 65-75% vo^2max for 3 weeks (3 sessions in a week for 35 minutes) and with 75-85% vo^2max for 3 weeks (3 sessions in a week for 40 minutes). The blood samples were collected in amount of 5 ml 48 hours before the first session and after the last session of the protocol. Other causes of abnormal liver enzymes such as hepatitis and autoimmune disorders etc. were excluded. The level of ALT (alanine aminotransferase) between experimental group and control group in post-test was not significant. But it was significantly differenced for level of AST (aspartate aminotransferase) when we compared the groups. On the other hands, the level of ALT and AST in post-test in contrast with pre-test in experimental group was not significant. The result of this study showed that endurance exercise for eight weeks did not normalize the level of ALT and AST of the study group. Therefore more investigation such as diet habits, demographic and other risk factors is recommended for these types of patients.

Key words: Alanine aminotransferase; Aspartate aminotransferase; Liver; Methadone

INTRODUCTION

One of the aims of exercise and sport in the society is getting health and improve the quality of lifestyle [1-3]. Curing the addiction means changing the lifestyle and making a healthy life. This changing involves having suitable diet and doing exercise. These two things help addicted person to resist against temptations of using opiate [4]. Having good diet and doing exercise remove the bad effect of opiate in the body, increase the consciousness of mind, make the addicted person independent to the opiate, make the addicted person hopeful about life, increase the addicted person's energy and self-consciousness, decrease the addicted person's stress and prevent of the probable diseases.

For curing the addicted persons the strength exercise is not recommended but stretchy and aerobics exercise is more effective [3-5].

Most of the body training experts believe that intensity of exercise is important. High intensity exercise damages the body and low intensity exercise has no effect on the body [1].

High intensity exercise increases stressed on the body and increases the amount of hepatic enzymes in the serum. Resistant and aerobics exercise should be balanced. Fatigue damages the liver that results in increasing of some hepatic enzymes like ALP, ALT and AST [6-8].

Addicted persons' low vitamin and mineral stores prevent inflammatory liver to provide bile and filtration and decrease the appetite [2].

Drugs like poisons are chemical materials which enter the liver from the outside of the body. Many drugs after enter the circulation enter the liver and will be changed. Some drugs after enter the liver change to the active materials and some other drugs will not be active any more [2].

For recognizing of a hepatic disorder usually the results of hepatic enzymes test collectively not separately are used. If the test indicates a disorder, hepatic biopsy should be done for submitting the results. Using drugs, opiates or supplements may increase the amount of enzymes in the serum [9]. The most sensitive and usable hepatic enzymes for recognizing of disorders are aminotransferases including aspartate aminotransferase and alanine aminotransferase [9].

Aminotransferases are naturally in different kinds of tissues like liver, heart, muscle, kidneys and brain. If each of these tissues is damaged, aspartate aminotransferase enter the circulation [10]. Naturally the level of ALT is higher than the level of AST in the liver. It cannot be said that ALT is just in the liver but level of ALT in the liver is more than the other tissues. If hepatic damage happens, ALT enters the circulation. The highest level of ALT and AST refer to vast hepatic necroses. Acute viral B/A hepatitis, hepatic damage that refers to using high dose of acetaminophen, lack of oxygen and nutrients in the liver increase hepatic enzymes in the circulation [10-13].

Some kinds of drugs increase liver enzymes such as ALT and AST. Unnatural liver enzymes level usually will be kept for some weeks or months after stopping the use of them [10, 14]. Doing exercise affects the organs like liver, kidneys and brain. Training affects suitably hepatic function, increases metabolism and antioxidant capacity [15]. The aim of this study was to determine the effect of endurance exercise on liver enzymes in eight weeks in Iranian women who are stopping the drug with methadone.

SUBJECTS AND METHODS

A scale with 0/01 kg and 0/1 cm accuracy were used for measuring both weight and length. Cooper 12 minutes test was used for measuring vo^2_{max} so the women prisoners who used methadone were asked to run in the yard. A caliper with SAEHAN mark and SH5020 model which had been made in England was used for measuring the percent of body fat by 3 points method of triceps, suprailiac skin fold and thigh. Puloock Jackson three point formulas were used to determine percent of total body fat. Beurer belt was used to determine the intensity of endurance exercise. Amount of BMI were calculated by a standard formula. Sixty Iranian women prisoners who are stopping the drug with methadone were enrolled in this study. They voluntary were

departed and divided into experimental group (n=30) and control group (n=30). Blood samples were collected from the subjects in the clinic of prison 48 hours before and after the first and last sessions of training. Finally 5cc blood samples were collected and the tubes were taken to Kavosh laboratory in Karaj in convenience time. The amount of liver enzymes, AST and ALT were measured by photometer, an automatic set, before and after the test. Other causes of abnormal liver enzymes such as hepatitis and autoimmune disorders etc. were excluded.

Statistical methods

In this research, kolmogorove-Smirnove (K-S) test was used to ensure the normal distribution of collected data. Independent T-test was used for contrasting mean of variables of two groups of research. Dependent T-test was used for contrasting mean of variables of experimental group in pretest and posttest.

RESULTS

According to statistical results, the different level of ALT between two groups in post-test was not significant ($P=0/15$) but it was significant for level of AST between two groups ($P=0/01$). Level of AST in control group was decreased in post-test. The different level of ALT and AST in experimental group in pre-test and post-test was not significant. On the other hands different percent of body fat between two groups in post-test was not significant ($P=0/21$). Percent of body fat was increased in post-test in experimental group but the different percent of body fat in pretest and posttest was significant ($P=0/001$). Different amount of VO_2_{max} between two groups in post-test was not significant. The different amount of VO_2_{max} in experimental group in pretest and post-test was significant ($P=0/01$). Different amount of body mass index between two groups in pre-test post-test was not significant. The different amount of weight in experimental group in pretest and posttest was not significant and also it was not significant when we compared the two groups.

Table 1. Statistical indexes which relate to general characteristics of two groups

	Experimental group	Control group
Mean (cm)	162/2	158/8
Standard deviation	4/60	5/63
Mean (age)	33/8	32/8
Standard deviation	10/66	8/25

Table 2. Comparing amount of %BF, BMI, VO₂max, weight, ALT and AST of two groups

group	Evaluation	BMI (kg/m ²)	VO ₂ max (ml/kg/min)	%BF	Weight (kg)	ALT (U/L)	AST (U/L)
Experimental	Before training	24/22 4/82	16/18 7/14	33/10 1/65	62/2 13/71	10/2 2/58	16/2 2/48
	After training	23/62 4/04	23/19 8/06	35/64 1/48	60/6 11/50	13/6 3/64	16/2 1/92
Control	Before training	26/34 4/91	13/92 7/20	32/94 5/56	65/7 15/27	17/4 7/30	24/6 11/69
	After training	27/02 7/21	9/64 5/22	36/44 4/42	67/8 22/87	17/8 12/89	20/4 5/36

It means that endurance exercise for 8 weeks does not significantly affect level of AST and ALT in the serum. Experimental and control group's mean and standard deviation of age and length are presented in table 1 and their mean and standard deviation of percent of BF, BMI, weight, VO₂max, ALT and AST are shown in table 2.

DISCUSSION

In recent societies, people from different class, age or sex use different opiate for several reasons. In several societies, some psychological and physiological methods are used to prevent and curing this problem. There are some centers in Iran in which addicts were cured. In some centers methadone is used for curing the addicts. Methadone like other drugs has some advantages and disadvantages. One of its disadvantages is liver disorder. Methadone is an industrial material which is used for stopping the opiates like heroin. Stopping of methadone is difficult and takes some months or years. Using this drug increases liver enzymes in the serum. Usage a lot of methadone makes high mortality [2].

Methadone is not safe and it differently affects several persons. A person's amount of using methadone may be dangerous for the other person. If a person's body endurance is high and uses methadone he/she can continue his/her life safely but if a person's body endurance is low and uses methadone he/she may die [2]. However, in this research we tried to find a way to decrease the harms of methadone on the liver by endurance exercises but our results rejected any associations.

In many researches, the effect of different kinds of exercise was shown on different people's liver enzymes but not on the addicts or people who

used methadone. Their results were different. This research was shown that endurance exercise for 8 weeks did not significantly decrease the level liver enzymes in the serum.

Devries et al. (2008) indicated that level of ALT after training for 12 weeks was unchanged [16]. This finding is compatible to result of our research. Subject's different weight and additional weight or using protein stores as an energy store because of poor diet are reasons of this compatibility. Nobahar (1386) indicated that after running on a treadmill with first speed of 6-8km/h for 3 minutes, running 3km/h as an active rest and then increasing 2km/h to the previous amount of speed for a week, level of ALT except the first day of training and after recovery period in one session group, in two groups in other days was significantly increased [17]. The result of training in two session's group after 24 hours is compatible but in one session group is not compatible to our result.

In our study, comparing means levels of AST before and after doing endurance exercise for 8 weeks in experimental group was unchanged. Also Nobahar indicated that level of AST in two groups after the first, fourth and seventh day of training was significantly increased and after 24 hours in recovery period was significantly decreased [17]. The result is not compatible to result of our research. Different amount of use of methadone or some subject's increasing amount of use of methadone are reasons of the incompatibility.

We concluded that endurance exercise for 8 weeks doesn't decrease the level of liver enzymes in the serum in the women who use methadone. Our subjects' smoking, circle of menstruation in the time of bleeding, changing the amount of using methadone (according to physician's

permission), not being sufficient of the period of protocol and a few amount of subjects resulted in the level of liver enzymes significantly didn't change. So we suggested that other research is done on the women whom it is not necessary to be changed their amount of using methadone,

they are forbidden to smoke, their circle of period are the same at the time of bleeding, the period of protocol are increased, they are selected from other range of ages and the amount of subjects are not less than 10.

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