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Effect of aerobic training on total cholesterol and blood sugar at fasting condition among obese women

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Abstract
The aim of the research was to determine the effect of aerobic training on total cholesterol (tc) and blood sugar at fasting condition among obese women. For this purpose, 40 female obese women (age 18 -25) were selected. The selected subjects were divided into two equal groups of 20 subjects each. Group –I considered as experimental who underwent 12 weeks of aerobic training and Group-II acted as control who did not undergone any special training apart from their day today activity. The subjects of experimental group recivr aerobic training only one session in the morning between 6-7 am for three alternate days a week for twelve weeks. To analyse the collected data 'F' ratio was used. The level of significance was fixed at 0.05 level of confidence. The results showed that there were significant changes in total cholesterol and blood sugar at fasting condition. It was concluded that the aerobic training is widely believed to induce changes in the total cholesterol and blood sugar at fasting condition of obese women.

Keywords: Aerobic training, total cholesterol, blood sugar at fasting condition, obesity

1. Introduction
Exercise is most important for every living being; in other words we can also say that physical inactivity results in several types of diseases in the body. Regular exercise not only keeps our body regular fit but it also helps in maintaining out mind fresh for a longer period of time. Out mind will not feet tired if we do the regular exercises. It also increases the blood circulation of the body and prepares as for the hard work, all day long regular exercise also can prevent chorionic diseases and other health problems related to lungs and heart. Regular exercises help to strengthen the heart. The muscle mass can increase and the weight can be controlled Praveen Ganesan, 2009 [7]. Aerobic exercise is physical exercise that intends to improve the oxygen system. Cooper, Kenneth C aerobic means ''with oxygen'', and refers to the use of oxygen in the body s metabolic or energy- generating process. Many type of exercise are aerobic, and by definition are performed at moderate levels of intensity for extended periods of time Cholesterol from the Greek chole-(bile) and stereos-(solid) followed by the chemical suffix-oc for an alcohol, is an organic chemical substance classified as a way steroid of fat. It is an essential structural component of mammalian call membranes and is required to establish proper membrane permeability and fluidity. In addition, cholesterol is an important component for the manufacture of bile acids, steroid hormones, and vitamin D. cholesterol is the principal sterol synthesized by animals, predominantly in the liver Olson RE (February 1998). François poulleties de la sale first identified cholesterol in solid form in gallstones, in 1769.hower, it was only in 1815 that chemist eugne cheneeul named the component ''cholesterine'' http://www.wikipathways.org/index.php/Pathway: Total fat intake also plays a role in blood cholesterol levels. This effect is thought to come about by changes in the quantity of cholesterol and lipoproteins that are synthesized by the body. In particular, saturated, monounsaturated and polyunsaturated fats have been shown to increase HDL-based cholesterol levels, with saturated fats also increasing LDL-based cholesterol levels. M. Svoboda and D.A Giordano, 1988. Over the past four decades, obesity has been on the rise. Obesity is a chronic disease with strong component obesity can also have a major impact on a women's fertility.

Blood sugar means glucose in the blood stream. Glucose is the main sugar found in the blood and the body's main source of energy.

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It is also called blood glucose or blood sugar. A form of sugar that is the body's primary fuet glucose broken down from food can be converted into energy or stored. Abnormally low or high levels of glucose in the blood of ten indicate metabolic disturbances (eg, diabetes). In medicine, blood sugar is glucose in the blood. Blood sugar concentration is an important factor in diabetes. More specifically it involves the break of sugar into usable energy. The body's ability to regulate levels of sugar in the blood is also important to overall blood health weight centric, and moods. The natural hormone in the body which controls blood sugar levels is insulin which depends on the presence of the mineral clocomium in order to function. Other nutrients which activate enzymes involved in sugar and carbohydrate metabolism are zinc, magnesium, vanadium, alpha-lipoic acid and vitamin.

Digested carbohydrates produce sugar, which, circulates in blood and is used by the body as fael. Absorption of the sugar into the cells regulated by the hormone insulin, which is produced in the pancreas and released when blood sugar level rises. Too low a concentration is known as hypoglycaemia, sugar in the form of glucose present in the blood, and is normally 60 to 100 milligrams/100 milliters of blood. It rises after a meal to as much as 150 milligrams/100 millilitres of blood, but this may way. The uptake of glucose by the working muscles can be further enhanced if carbohydrate is ingested either prior or during exercise, 2009. www.patient's medical.com

2. Methods
2.1 Subjects
Forty obese female students from various department of Kerala University volunteered to participate in this study. The selected subjects were divided into two equal groups of 20 subjects each. Group –I considered as experimental group who underwent 12 weeks of aerobic training and Group-II acted as control who did not undergone any special training apart from their day today activity. Before participation, all subjects read and signed an informed cogent form Exclusion criteria were the presence of chronic medical conditions such as asthma, heart disease or any other condition that would put the subjects were at risk when performing the experimental tests. The total cholesterol and blood sugar at fasting condition of all subjects were measured in joy medical laboratory.

2.2 Aerobic training
The aerobic training programme was scheduled for only one session in the morning between 6-7 am for three alternate days a week for twelve weeks.

2.3 Collection and analysis of blood samples
To examine the total cholesterol and blood sugar at fastening condition, blood samples were collected from the subjects one day before the beginning of training and one day after the training at fasting condition. 5ml of blood was obtained from each subject left arm vein in sifting and resting position with the help of trained nurse. Blood was collected in a dry test tube and allowed to coagulate at ambient temperature for 40 minutes. Serum was separated by centrifugation at 200 rpm for 10 minutes and used for lipid profile estimations serum total cholesterol and blood sugar at fasting condition were estimated by the methods of allainal. (1974) (a) and izzo et al. (10) respectively.

2.4 Statistical analysis
Statistical technique used for analyzing the collected data in the study was 'F' ratio. The level of significance was fixed at 0.05 level of confidence.

3. Results
All subjects were tested for total cholesterol and blood sugar at fasting condition. The collected data were analyzed by 'F' ratio with the level of significance was fixed at 0.05.

3.1 Total cholesterol
The data obtained before and after aerobic training on total cholesterol was analyzed by 'F' ratio analysis is of covariance and presented in.

3.2 Analysis of Total Cholesterol
Analysis of Covariance of Data on Total Cholesterol between and Pre and Post Tests of Experimental and Control Groups.

Table I: Analysis of Total Cholesterol before and After Training

Test	Experimental Group	Control Group	Sources of variance	Sum of squares	df	Mean square	Obtained 'F' ratio
Pre test							
Mean	289.70	290.15	Between	2.025	1	2.025.	.049
S.D	6.38	6.47	With in	1570.75	38	41.34	
Post test							
Mean	270.00	291.75	Between	4730.63	1	4730.63	197.16*
S.D	3.36	6.06	With in	911.75	38	23.99	
Adjusted Post test							
Mean	270.08	291.67	Between	4658.21	1	4658.21	236.20*
			With in	729.70	37	19.72	

*Significant at.05 level of confidence. (The table value required for significant at 0.05 level with df 1 and 38 and 1 and 37 are 4.096 and 4.104 respectively)

The table shows that the pre-test mean values on total cholesterol for experimental group and control group were 289.70 and 290.15 respectively. The obtained 'F' ratio value.049 for pre-test score on total cholesterol which was less than the required table value 4.096 for significance with df 1 and 38. The post-test mean values on total cholesterol of experimental group and control group were 270.00 and 291.75 respectively. The obtained 'f' ratio 197.16 for post test scores on total cholesterol which was more than the required table value 4.096 for significance with df 1 and 38.The adjusted post-test mean values on total cholesterol for experimental group and control group were 270.08 and 291.67 respectively. The obtained 'f' ratio value 236.20 for adjusted post-test mean values on total cholesterol which was more than the required table value 4.104 for significance with df 1 and 37. The result of the study showed that there was a

significant difference between experimental group and control group on total cholesterol.

3.3 Blood sugar
The data obtained before and after aerobic training on blood sugar were analyzed by 'f' ratio analyses of covariance and presented in.

3.4 Analysis of Blood Sugar at Fastening Condition
Analysis of Covariance of Data on Blood Sugar at Fastening Condition between and Pre and Post Tests of Experimental and Control Groups.

Table II: Analysis of Blood Sugar at Fastening Condition before and After Training

Test	Experimental group	Control Group	Sources of variance	Sum of squares	df	Mean square	Obtained 'F' ratio
Pre test							
Mean	97.75	97.70	Between	2.500E-02	1	2.500E-02	
S.D	4.97	4.84	With in	913.95	38		.001
Post test							
Mean	87.60	96.60	Between	810.00	1	810.00	
S.D	5.67	4.75	With in	1039.60	38	27.36	29.61*
Adjusted Post test							
Mean	87.59	96.61	Between	812.50	1	812.50	
			With in	968.12	37	26.17	31.05*

* Significant at.05 level of confidence. (The table value required for significant at 0.05 level with df 1 and 38 and 1 and 37 are 4.096 and 4.104 respectively)

The table shows that the pre-test mean values on blood sugar for experimental group and control group were 97.75 and 97.70 respectively. The obtained 'F' ratio value.001 for pre-test score on blood sugar which was less than the required table value 4.096 for significance with df 1 and 38.The post-test mean values on blood sugar of experimental group and control group were 87.60 and 96.60 respectively. The obtained 'f' ratio 29.61 for post test scores on blood sugar which was more than the required table value 4.096 for significance with df 1 and 38.The adjusted post-test mean values on blood sugar for experimental group and control group were 87.59 and 96.61 respectively. The obtained 'f' ratio value 31.05 for adjusted post-test mean values on blood sugar which was more than the required table value 4.104 for significance with df 1 and 37.The result of the study showed that there was a significant difference between experimental group and control group on blood sugar.

4. Discussion
Significant fall in cholesterol was observed by Dange *et al.* 2 during yoga treatment on 25obese patient over a period of 4-5 months. Khare *et al.* 5 also determines that running have definite value in lowering total cholesterol.

5. Conclusion
1. Based on the results of the study, it was concluded that, there was a significant experimental and control groups difference between on total cholesterol and blood sugar at fastening condition.
2. Further it was concluded that there was a significant reduction on total cholesterol and blood sugar due to 12 weeks of aerobic training which was followed in this study.

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