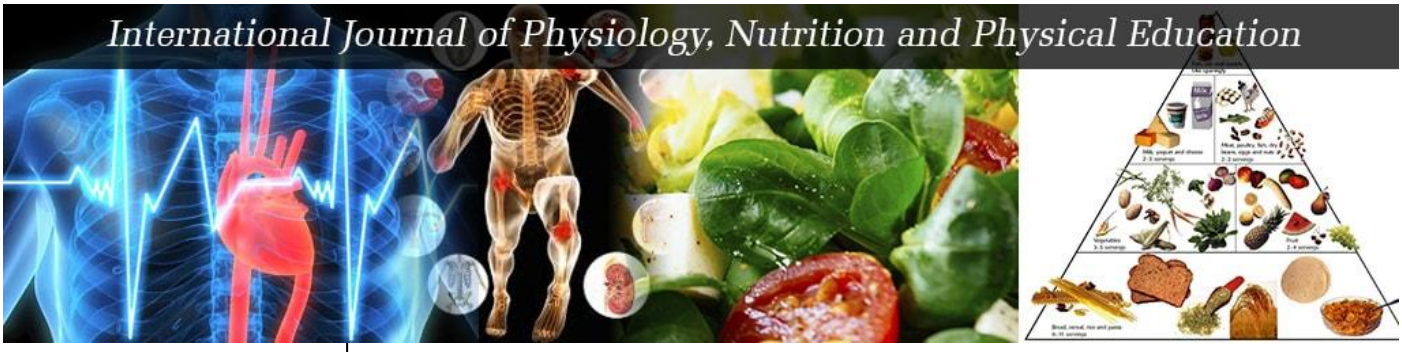

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Effects of aerobics programme on physiological profile of diabetic patients

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Abstract
Background: Aerobics is a very good activity for fitness. Aerobic activity can lower the need for insulin.
Purpose: The purpose of this study was to analyze the Effects of Aerobics Programme on Physiological profile of Diabetic Patients.
Selection of subjects: Twenty Five patients were selected as a subject for the purpose of the study. The selected Diabetic patients were suffering with the Type-I and Type-II Diabetics. The age of subjects was between 30 and 60 years.
Selection of Variables: Blood Glucose Estimation (BGE) Fasting, Glucose Tolerance Test (GTT) up to 2 hours after administration of 50gm of glucose orally, Systolic Blood Pressure, Diastolic Blood Pressure, BMI, Resting Pulse Rate and Respiratory Rate were selected as criterion variables. Collection of data- first the data was taken before implementing the treatment and again data was taken after 16 week of training. Analysis of data- Mean, S.D. and 't' test was calculated to know the effects of Aerobics Programme on selected physiological variables. Results- as a result it was found that there is significant effect of Yogic kriyas on Physiological Variables of diabetic patients. Conclusion-Aerobics Programme is very effective in controlling diabetes; everyone should make it a part of their life.

Keywords: Diabetes, aerobics programme, blood glucose estimation, glucose tolerance test, body mass index, resting pulse rate and respiratory rate.

Introduction

The most common endocrine disorder is diabetes mellitus caused by an inability to produce or use insulin. Diabetes mellitus is the fourth leading cause of death by disease in the United States, primarily because of its damage to the cardiovascular system, because insulin is unavailable to aid transport of glucose into body cells, so blood glucose is high and glucose 'spills" into the urine (glucosuria).

These two types of diabetes are also known as Type-1 and Type-2 Diabetes. Type 1 diabetes occurs because the insulin-producing cells of the pancreas (called beta cells) are destroyed by the immune system. People with type 1 diabetes produce no insulin and must use insulin injections to control their blood sugar. Type 1 diabetes most commonly starts in people under the age of 20, but may occur at any age. It is also called insulin dependent diabetes mellitus (IDDM)

Type 2 Diabetes: With type 2 diabetes, the body continues to produce insulin, although insulin production by the body may significantly decrease over time. The pancreas produces either not enough insulin, or the body is unable to recognize insulin and use it properly. When there isn't enough insulin or the insulin is not used as it should be, glucose can't get into the body's cells to be used as energy. This glucose then builds up in the blood.

The disease comes on surface only when the 80% of the beta cells becomes dead and there is no way we can regenerate those beta cells so the loss is a forever loss. This is basically of two types, first is by birth, which is still unavoidable and scientist still could not find how it can be prevented to transfer in babies.

Properly prescribe exercise is always an effective adjunct to insulin and diet for the diabetic patients. Exercise facilitates the utilization of glucose level. In essence, exercise itself has an insulin type effect. In addition exercise increases energy expenditure and help the individual to lose weight. Furthermore, research also suggests that aerobic exercise may help in improve

glucose tolerance insulin (the ability of body to metabolize glucose) and increase insulin sensitivity so that less insulin needs to be secreted by the pancreas.

Physical activity not only improves the general physical fitness, including cardiovascular performance and muscular strength, but it also has a marked impact on several metabolic parameters such as lipid metabolism and glucose tolerance. Of the entire different physical activity programme available, the aerobic exercise appears to poses the greatest potential for improving our health. William Haskell of Stand ford University, an international respected authority of therapeutic aspect of exercise, has noted recently that although aerobic type exercise by itself is not obviously panacea for all disease, the available research data support its use a treatment for various medical conditions and its value in overall programme of health promotion. In this later regards, aerobic exercise may also serve catalyst to other life-style changes such as nutrition, weight control and smoking. An aerobic exercise is medicine.

"Aerobic" basically means living or working with oxygen. Aerobics or endurance exercises are those in which large muscle groups are used in rhythmic repetitive fashion for prolonged periods of time. Aerobics refers to a variety of exercises that stimulates heart and lungs activity for a time period sufficiently long to produce beneficial changes in the body. Running, swimming, cycling and jogging are typical aerobic exercises.

Aerobic is a form of exercise and the concept of aerobic dancing made famous by Jane Fonda. Dr Kenneth H. Cooper is known the father of aerobics. Aerobic dancing is a series of callisthenic exercise movements done on music. It is an excellent all-round exercise programme since any amount of exercise can be incorporated into the programme to enhance the body's cardiovascular fitness, muscular strength and suppleness. In total aerobics exercise programme take care of all the components of physical fitness.

Aerobic exercise means the exercise where all body parts muscles are supplied with enough oxygen with the increased heart rate. Aerobic exercises include brisk walking, jogging, swimming, cross-country, skiing, hopping, and skipping. By doing aerobics, the whole body is used and major muscle groups including legs, trunk and arms get involved. In aerobic exercise the heart rate increases substantially, but never reaches its maximum level. The heart is always able to deliver sufficient oxygen-rich blood to muscles so that they can derive energy from fat and glycogen aerobically.

Aerobic exercises build stamina for sports and it also is the most important form of exercise for health, since it increases the efficiency of heart, circulation and muscles. Aerobic exercise is the keystone of fitness by doing aerobics it increases the capillary network in the body.

So continuity, intensity of exercise and participation of the whole body parts are the most important elements of an aerobic exercise programme. Aerobic exercise in any physical activity requires the heart rate to reach at least 60% of the maximal heart rate for an extended period of time. Then only the full benefits of the exercise programme can be enjoyed.

O'Shea undertook this study (I) to see if aerobics exercise is safe for women with gestational diabetes and their fetuses and (ii) to see if exercise improve carbohydrate metabolism in women with gestational diabetes and help them maintain normal blood glucose level without the need for insulin therapy. He required six diet controlled women with gestational diabetes between 25 to 39 weeks gestation. The women were beginning to demonstrate a need for insulin by increasing fasting blood glucose level inspire of dietary compliance. The exercise session was fetal monitoring unit at New your hospital using a cycle ergo meter to gradually raise maternal heart rate 75% of their age predicted maximum for 20 minutes. Maternal and fetal well-being were assessed as 'normal' by continuous monitoring by an obstetrician prior to during and following exercise. This exercise produced no unsafe change in lactate level, PH, blood pressure or fetal heart rate Observation indicate, that sub maximal aerobics exercise up to 75% of the maternal age predicate max. Were safe for both women with gestational and their fetuses. A 50 gm 3 hour glucose tolerance test was performed immediately after exercise and repeated without exercise either two day before or after the exercise session. To assess the effect of exercise on carbohydrate metabolism in women with gestational diabetes, His findings showed no significant change in carbohydrate metabolism resulting from the one testing session. This suggest only one exercise session was insufficient to determine whether exercise can improve carbohydrate metabolism with gestational diabetes. Therefore further research should be designed to determine what duration and frequency of aerobic exercise, if any, will help improve carbohydrate metabolism in women with gestational diabetes.

Kin Jsier and Others (2001) [5] examined the effect of 8 weeks of step aerobics and aerobic dancing on blood lipids and lipoproteins. Methods: Experimental Design: Comparative Training. Setting: Two months of physical fitness programme. Participants: Forty –five sedentary female college student volunteers randomly assigned to one of the three groups as step aerobics (n=15), aerobic dancing (n=15 (and the control group (n=15). The step aerobics and aerobic dancing groups participate in sessions of 45 min per day, 3 days per week for 8 weeks with 50-70% of their heart rate reserve. Total cholesterol (TC), triglycerides (TG), low- density lipoprotein cholesterol (LDLC), the ratio of total cholesterol to high density lipoprotein cholesterol (TCHDL -C). RESULTS: At the end of the 8 weeks period, a significant difference has been found between the step aerobics group and the control group and between the aerobic dancing group and the control group in TC levels ($F [2, 44] = 8.33$; $P < 0.01$). A significant difference in HDL-C levels ($F [2, 44] = 3.65$, $P < 0.05$) and TC: HDL-C ratio ($F [2, 44] = 11.56$, $P < 0.01$) has been found only between the step aerobics group and the control group. These results indicate that step aerobics training is an effective training is an effective training mode for modifying lipid and lipoprotein profiles of female college – aged students.

Methodology

Selection of subjects

Twenty Five patients were selected from Ashian Town Society Rehabilitation Centre, Bhiwadi, Rajasthan, the selected Diabetic patients were suffering with the Type-I and Type-II Diabetics. The subjects were from wide range of age group that is 30 to 55 years.

Selection of Criterion Variables

Physiological variables that is Pre-Prandial BSL, Post-Prandial BSL, Systolic Blood Pressure, Diastolic Blood Pressure, BMI, Resting Pulse Rate and Respiratory Rate

Collection of data and Results of the study

First the data was collected before starting the training and

again the data was taken after 16 week of aerobics programme training and was analyzed according to experimental design of the study.

Table 1: Analysis of physiological profile of diabitic patients for aerobics programme before and after 16 week of training

Variable	Aerobics Group (N=25)			
	Pre Treatment		Pre Treatment	
	Mean	SD	Mean	SD
Pre-Prandial BSL	154.08	12.71	117.76	12.45
Postprandial BSL	194.24	13.620	164.60	14.95
Systolic B.P.	122.12	7.699	109.44	6.44
Diastolic B.P.	75.52	9.224	67.52	5.42
B.M.I.	25.54	1.567	23.88	1.00
Resting Pulse Rate	74.56	4.062	71.68	3.80
Respiratory Rate	18.12	2.415	15.80	1.38

Table 1 clearly reveals that there are significant changes in pretreatment and post-treatment mean of Physiological profiles of diabetic patients i.e. 154 and 117 for Pre Prandial BSL, 194.24 and 164.60 for post prandial BSL, 122.12 and 109.44 for systolic Blood Pressure, 75.52 and 67.52 for diastolic blood pressure, 25.54 and 23.88 for BMI, 74.56 and 71.68 for Resting pulse rate, and 18.12 and 15.80 for Respiratory rate respectively.

Graphical representation of Comparative analysis of Aerobics Programme before and after 16 week training of aerobics programme is given in fig. 1

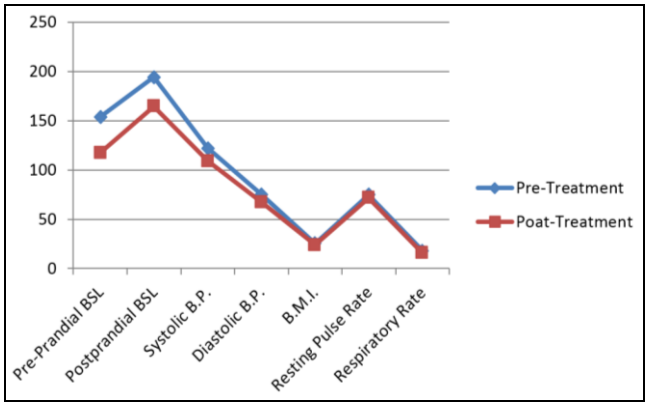


Fig 1:

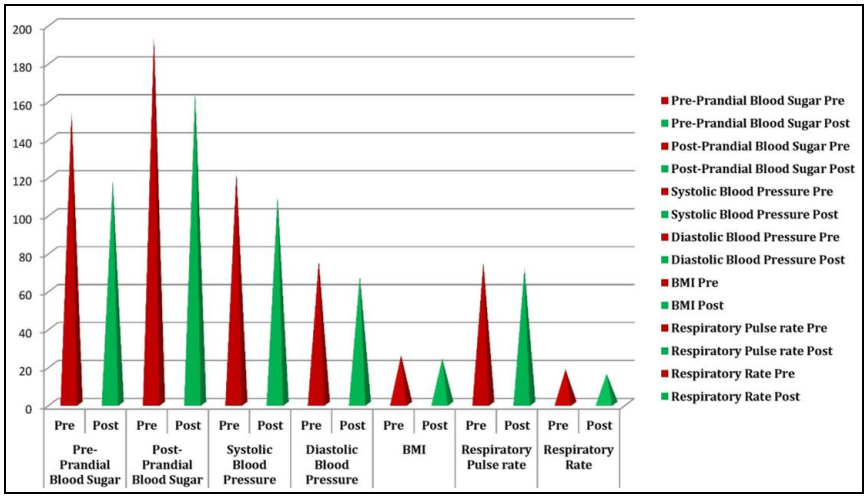
The descriptive analysis of the pre and post test data showing mean, standard deviation and 't' ratio of Selected Physiological Variables of diabetic patients after 16 week of aerobics programme is presented in table 2.

Table 2

Variable		Mean	S.D.	't' test
Pre Prandial BSL	Pre	154.08	12.71	10.40*
	Post	117.76	12.45	
Post Prandial BSL	Pre	194.24	13.62	7.32*
	Post	164.60	14.94	
Systolic Blood Pressure	Pre	122.12	7.69	6.32*
	Post	109.44	6.44	
Diastolic Blood Pressure	Pre	75.52	9.22	3.74*
	Post	67.52	5.42	
BMI	Pre	25.54	1.56	4.47*
	Post	23.88	1.00	
Resting Pulse Rate	Pre	74.56	4.06	2.58
	Post	71.68	3.80	
Respiratory Rate	Pre	18.12	1.05	8.00*
	Post	15.80	1.00	

The table clearly reveals that there is significant difference in Pre and Post implementation of Aerobics Programme on Pre-Prandial BSL, Post prandial BSL, Systolic blood pressure, Diastolic blood pressure, BMI, Resting Pulse Rate, and Respiratory rate of Diabetic Patients as the tabulates value of all these are greater than the table value i.e. 2.01 at .05 level of confidence.

The graphical representation of data is presented in Fig-2



Discussion of Findings

Exercise is helpful in keeping diabetes control, and as the results shows aerobics too have shown significant benefits in controlling the physiological variables of diabetic patients.

Conclusions

Seeing the above findings we can conclude that aerobics is very beneficial for all age groups in the treatment of diabetes.

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