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Effect of Evening Aerobic Exercise on Fasting Blood Glucose of Type II Diabetics

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ABSTRACT

The purpose of the present study was to find out the effect of evening aerobic exercise on fasting blood glucose levels of type II diabetics. For the purpose of the study 30 type 2 diabetic patients (N = 30) were randomly selected as subjects. The selected subjects underwent aerobic exercise in the evening for a period of 16 weeks (4 days per week). The data were collected before and after the intervention and the collected data were analyzed by using the correlated t-test. The result of the study revealed that the evening exercise reduced fasting blood glucose levels of these type 2 diabetics.

Keywords : Aerobic Exercise, Fasting Glucose.

I. INTRODUCTION

Diabetes mellitus refers to a group of diseases that affect how the body uses blood sugar (glucose). In diabetes irrespective of type, there is too much glucose in blood. This excessive glucose can lead to severe health problems. (**Sparti** and **Decombaz 1992)**. Type II diabetes is also called non-insulin dependent diabetes mellitus. Varying degrees of insulin resistance and relative insulin deficiency are the characteristics of type II diabetes, weakening β-cell function being the major defects in the development and worsening of hyperglycemia **(Derosa and Maffioli 2012)**. Physical activity is strongly suggested for individuals with diabetes as regular exercise is connected with greater life expectancy and a lesser occurrence of diabetic complications in this population. Higher levels of physical activity are related to better physical fitness, favorable lipid profiles, decreased cardiovascular disease risk, enhanced endothelial function, belated onset and/or succession of peripheral neuropathy and superior self-reported quality of life in people with diabetes mellitus **(Nakagami 2004)**. Exercise training has time and again been a useful weapon for the treatment and prevention of type II diabetes. A single bout of exercise reduces glucose levels and increases insulin sensitivity for hours or even several days. Moreover, short-term exercise training improves insulin response to glucose (**Pehleman 2005)**. Improvement in glycaemic control is one of the therapeutic effects of exercise training in patients with type II diabetes include (**Numao 2012)**. Exercise and calorie restriction are suggested as the initial remedial measure to non-insulin-dependent Type II diabetes mellitus (Type II DM). Exercise is beneficial for the prevention and/or differing of vascular complications in Type II DM patients as it often results in the improvement of obesity, body fat composition, insulin sensitivity, glycemic control, blood pressure, and atherogenic lipid profile (**Mikines 1988)**. Aerobic as well as resistance training have been recommended and applied as exercise prescriptions and both of them have benefitted patients with type II diabetes. Aaerobic exercise if continued for long periods has been reported to improve glucose and lipid metabolism in diabetic patients. Aerobic exercise training is a well-known therapeutic approach in controlling type II diabetes mellitus (T2DM) because of its beneficial effects. Exercise improves diabetic status and depresses the metabolic risk factors linked with cardiovascular diseases and enhances insulin sensitivity. Exercise also plays a big role in mediating the glycemic and insulinemic responses to carbohydrates **(Kernmer** and **Berger 1983)**. Long-term exercise/training over periods of several weeks has improved insulin sensitivity and reduced glycemic responses (**Henriksen 2002)**. Exercise is known to be of the cornerstones for

the cure of type II diabetes. Aerobic endurance exercise has customarily been known as the most appropriate exercise approach **(Greenberg** and **McDaniel 2002)**. Resistance exercise has recently been revealed to be handy to glucose metabolism **(Nishida 2004)**. Joint endurance and resistance exercise has not only contributed to improved glucose control but also to better fitness **(Young 1989)**. Physical exercise has been pointed out to be a non-pharmacological treatment for type II diabetes **(Rose 2001)**. Exercise lessens body weight, improves lipid profile, controls BP and endothelial dysfunction, and improves insulin sensitivity, glycaemic control and cardiovascular fitness. Endurance exercise training improves glucose tolerance and insulin action on skeletal muscle glucose metabolism in insulin-resistant subjects with impaired glucose tolerance or type II diabetes **(Peirce 1999)**. Aerobic training elevates maximal oxygen uptake (VO2Max.) while resistance training enhances muscle force and size of muscle fibers **(Cauza 2005)**. Both training methods have improved blood glucose control and insulin sensitivity in patients with type II diabetes. Even studies which used combined aerobic and resistance training has also reported beneficial effect on such patients **(Sigal 2007)**. Since exercise diminishes or lessens insulin resistance and improves insulin sensitivity, it is a sensible, logical and wise treatment modality. Exercise also improves lipid abnormalities and hypertension.

II. METHODS AND MATERIAL

The purpose of the study was to evaluate the influence of morning aerobic exercise on glucose (Fg & Ppg) levels of type 2 diabetic patients. To achieve the purpose, fifteen type 2diabetic patients were selected at random as subjects (N=15). The selected subjects underwent aerobic exercise in the morning for duration of 45 minutes for 16 weeks (4 days per week). The data was collected at the base line and at the end of the exercise programme and the collected data were statistically analysed by using correlated t-test. The level of confidence was fixed as 0.05.

Table 1.

Variable	Mean	Std. Deviation	Std. Error Mean	T value	df	Sig.
Prefg	153.21	13.09	2.47	13.693	27	.000
Postfg	139.57	9.93	1.87			

III. RESULTS AND DISCUSSION

The triad of insulin, diet and exercise has been the basis for treatment of diabetes for the past 60 years. If insulin is given regularly and diet is also managed very strictly but the lifestyle is sedentary, it will be impossible to treat the diabetic patients and regulate their blood glucose levels. But with the introduction of exercise the other two will double their effect. So in other words exercise is the primary criterion to control glucose levels of type 2 diabetic patients and also for healthy individuals not to become type 2 diabetes. (Erikson and Lindgarde). Each individually or in combination has place in the treatment regimen. The exercise program in conjunction with diet and oral medication can cause glycemic control, weight and cardiovascular risk factors reduction and improvement in the mental well-being of the patient. So it is like 'united we stand divide we fall'. With the mingling of exercise with diet and medication wonders work for the treatment of type 2 diabetic patients and the control of glucose levels. Exercise itself can maintain glucose levels to a great extent except in some serious cases (Franz and Giacca and Elane). Efficacy of the treadmill walking exercise as a supplement to diet and drug in controlling the diabetic mellitus has been proven. It is important to exercise and adopt an active life style in order to cure diabetes and regulate the glucose metabolism (Nayak, Maiya and Hande). It's either the deficiency of the insulin or the failure of glucose uptake that leads to backup of glucose in the blood, resulting in hyperglycemia. The treatment of diabetes consists of, education, exercise, diet, oral hypoglycemic drugs and subcutaneous insulin therapy. So exercise awareness has been the corner stone for the treatment of diabetes and maintaining near normal blood glucose levels (Krall and Beaser). The results of our study are matching the results of the above mentioned studies as our study also shows that morning exercise significantly reduces the blood glucose (Fg & Ppg) levels of type 2 diabetic patients and helps them to maintain it near normal.

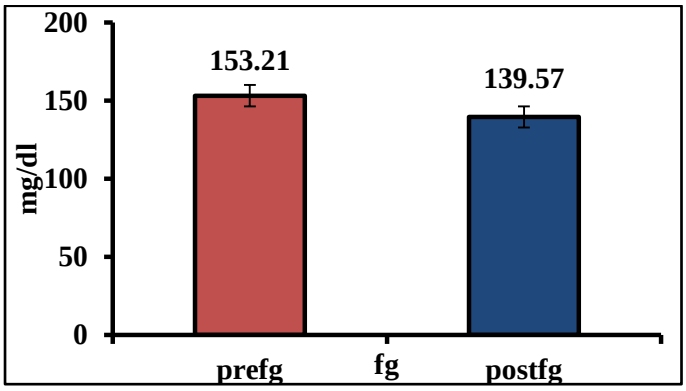

Figure 1.

IV. CONCLUSION

The result of the study revealed that the evening aerobic exercise significantly reduces the fasting glucose levels of type 2 diabetic patients. It can also be suggested that participation in evening exercise will be very beneficial for type 2 diabetic patients and this practice will enable them to maintain near normal blood glucose levels and also in the therapy of their diabetes.

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