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Effect of selected yogic asanas, surya namaskar, combination of surya nmaskar and selected yogic asanas on blood glucose level of type-II diabetic patients

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Abstract

Research in India on therapeutic effects of yogic asanas and Suryanamaskar were limited. Hence to have a better understanding of yogic asanas and Suryanamaskar and its contribution towards to diabetic patients, the scholar will make an attempt to determine the effect of twelve weeks of effect twelve weeks of selected yogic asanas, Suryanamaskar and combination of yogic asanas & Suryanamaskar on blood glucose level of type-II diabetic patients. The Blood Glucose Estimation (BGE) fasting was conducted to measure the blood glucose level of the subjects under the study. To determine the effect of twelve weeks of selected yogic asanas, Suryanamaskar and combination of yogic asanas & Suryanamaskar on blood glucose level of type-II diabetic patients, Analysis of Covariance was employed by using SPSS version 17. Further to find out which training programme was more effective LSD Post Hoc test was employed. The level of significance was set at 0.05 level of confidence. After 12 weeks, the combination of Yogic Asanas & Suryanamaskar group showed a significant improvement in the Blood Glucose Level of type-II diabetic patients than Suryanamaskar group and Yogic Asanas Group. It is concluded that combination of Yogic Asanas & Suryanamaskar group elicited a positive improvement in the Blood Glucose Level of type-II diabetic patients Suryanamaskar group and Yogic Asanas Group.

Keywords: Yogic asanas, suryanamaskar, type-II diabetic patients and blood glucose level

Introduction

The report presented by W.H.O. at the World Health Assembly at Geneva in May 2008 speaks about the shocking news about the rate of diseases in 2030. As per that report 14.2% of world's population will die due to coronary artery diseases. In 2004, the death rates due to Diabetes Mellitus is in 12th position and by 2030 it will move five places up to 7th position. Worldwide, there are an estimated 246 million people with diabetes and this number is set to reach 400 million by 2030. Population based studies have shown that nearly one in five of all patients with diabetes has one or more complications arising from the disease. It has emerged as a leading cause of blindness, kidney failure, amputations and heart attacks in our country. Diabetes Mellitus (DM) is the most common and possibly one of the oldest metabolic disorders in the world. It is characterized by multi-system dysfunction due to an elevated blood Glucose level. Normally the fasting level of blood glucose is less than 90mg/dL and the Post-Prandial (2hours) level is less than 120 mg/dL. If the Post-Prandial level Glucose Level is between 150 and 200mg the condition is labeled as an impaired tolerance and if above 200, it is DM.

Studies reveal that the change in the lifestyle increases possibility of diabetes in children. The basic problem is the fast food or bakery food culture developed in our society. As per the latest statistical report 45% of children in America are diabetic. In India it is approximately 10%. There are two broad types of Diabetes Mellitus.

(i) Primary or type I insulin dependent diabetes mellitus (IDDM)

It develops before the age of 40. This is often seen in children too. It is almost certain that the disease is auto-immune in nature and that there is a genetic predisposition.

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The body's defense mechanism attacks the pancreas and destroys the pancreatic cells and the level of endogenous insulin is very low. An environmental factor or factor of viral etiology is also thought to play an important role in the genesis of the disease.

(ii) Type II or non-insulin dependent diabetes mellitus (NIDDM)

It is the most common form of DM and accounts for 90% of all diabetes. This usually begins after middle age.

There are three subtypes: Non-Obese, Obese & Maturity – On Set Diabetes of the Young (NODY).

Endogenous insulin is adequate but in the face of stress, may fail. The defect here can be either one of the beta cells failing to produce enough insulin or impaired tissue sensitivity to insulin. There can also be secondary diabetes which is caused either by pancreatic disease due to the damage of cells of the gland or by the hormonal abnormalities like over functioning of the pituitary and adrenal glands.

The word yoga is derived from the Sanskrit root 'yuj' which means to join, to yoke, to bind and to concentrate on one's attention. Yoga makes the mind strong and able to endure pain and unhappiness. The power of determination and concentration are developed. Equilibrium and vitality became the normal state of mind after regular practice of yoga. Stability of mind is developed, life became easy and difficulties became stepping stones to perfect mental health. With yoga a man is able to inspire others by his behavior and action. The investigator intended to test the effect twelve weeks of selected yogic asanas, Suryanamaskar and combination of yogic asanas & Suryanamaskar on blood glucose level of type-II diabetic patients.

Methods

Selection of subjects

Eighty Diabetic Type II Patients from Alappuzha, Kerala were selected as subjects for the study. The age of the subjects ranged from 40 to 60 years. Those individuals who were undergoing any sort of training programmes were not included in the study. Prior to the pre-test, a meeting of all the selected subjects was held and they were explained regarding the objectives of the study, test procedures and training schedules so that they had a clear concept regarding the workload and effort they had to put in. They were requested to cooperate and participate actively throughout the programme. The medical screening of the subjects was carried out to ensure that the subjects were medically fit to undergo the type of training programme they were subjected to. The subjects were randomly assigned to an experimental group ($N=60$) [out of which 20 were given Suryanamaskar, another 20 were given Yogic Asanas Program, another 20 were given combination of Suryanamaskar & Yogic Asanas Program] and a control group ($N=20$).

Selection of variable

Blood Glucose Estimation (BGE) Fasting.

Tools

Fasting Blood Glucose Level was measured with the help of the Glucometer and the value of glucose in the blood is measured in mg/dl. The normal range of fasting glucose in the blood is 70-110mg/dl.

Selection of yoga training programme

After reviewing the literature pertaining to yoga and its contribution to the development of various systems in the body, the research scholar selected the following yogic asanas: Halasana, Bhujangasana, Yogamudra, Dhanurasana, Salabhasana, Ardha-Matsyendrasana, Paschimottasana, Padahastasana, Banasana, Bhadrasana, Supta-Vajrasana and Veerastambhasana. Savasana & Makarasana were used for relaxation process. The techniques of selected yogic asanas will be modified according to the level of physical fitness and health standards of the subjects under study. The modified forms of yogic asanas developed by Rosalind Widdowson and Louise Wiggins will also be included.

Administration of the training programme

The training programmes were carried out by the subjects under the supervision of the investigator with the assistance of other experts in the specialized field. The three experimental groups will perform the suryanamaskar, yogic asanas and the combination of suryanamaskar & yogic asanas prescribed to them; six days in a week; from Monday to Saturday for a period of twelve weeks. The control group did not involve in any similar form of training. The adaptation period of two weeks will be followed. The training load will be increased gradually, step by step after a definite time interval. The intensity of the training programme will be increased by the increase in the number of rounds in the case of the suryanamaskar and in terms of the duration of the holding time at the final position in the case of each asana.

Statistical analysis of data

Analysis of Covariance was employed to find the effect of suryanamaskar, yogic asanas and the combination of suryanamaskar & yogic asanas on the blood glucose levels of the Type II Diabetic Patients. Further to find out which training programme was more effective on the blood glucose levels of the Type II Diabetic Patients, LSD Post Hoc test was used with the level of significance set at 0.05 level of confidence.

Results

Effect of suryanamaskar, yogic asanas and the combination of suryanamaskar & yogic asanas on the blood glucose levels of the Type II Diabetic Patients were analyzed by ANCOVA & LSD Post Hoc test with the help of SPSS version 17. Findings pertaining to the effect of suryanamaskar, yogic asanas and the combination of suryanamaskar & yogic asanas on the blood Glucose levels of the Type II Diabetic Patient which were subjected to analysis of covariance have been presented in the table1. The mean difference of six groups of tournament chess players for the selected variable is presented in table 2, 3, 4, 5, 6 & 7.

Table 1: Analysis of covariance of blood glucose level for diabetic type II patients of three experimental groups and control group after twelve weeks of experimental treatment

Mean	S	YA	SYA	C	Sum of square		df	Mean sum of square	'F' value
Pre test	234.5	234.5	234.5	235.5	A	7.5	3	2.5	0.012
					W	7490	36	208.0	
Post test	225.1	227.8	224.9	236	A	812.5	3	270.8	1.39
					W	6977	36	193.8	
Adjusted post test	224.37	227.07	224.17	234.27	A	678.8	3	226.2	13.3*
					W	595.1	35	17.00	

*Significant at 0.05 level of confidence F0.05 (3, 36) = 2.86 F0.05 (3, 35) = 2.88

(S = Suryanamaskar group; YA = Yogic asana group; SYA = Suryanamaskar & Yogic asana group and C = Control group)

Table 1 clearly reveals that obtained equated 'F' value 13.30* is significant as it is much greater than tabulated 'F' value 2.88 required to be significant. Since 'F' value was found significant, LSD post hoc test was employed to find out the differences on Blood Glucose Level for diabetic type II

patients after 12 weeks of Suryanamaskar, Yogic Asana and combination of Suryanamaskar Yogic Asana practice. The data pertaining to the LSD post hoc test is presented in Table 2.

Table 2: Post Hoc mean difference comparison of blood glucose level for diabetic type ii patients of three experimental groups and control group after twelve weeks of experimental treatment

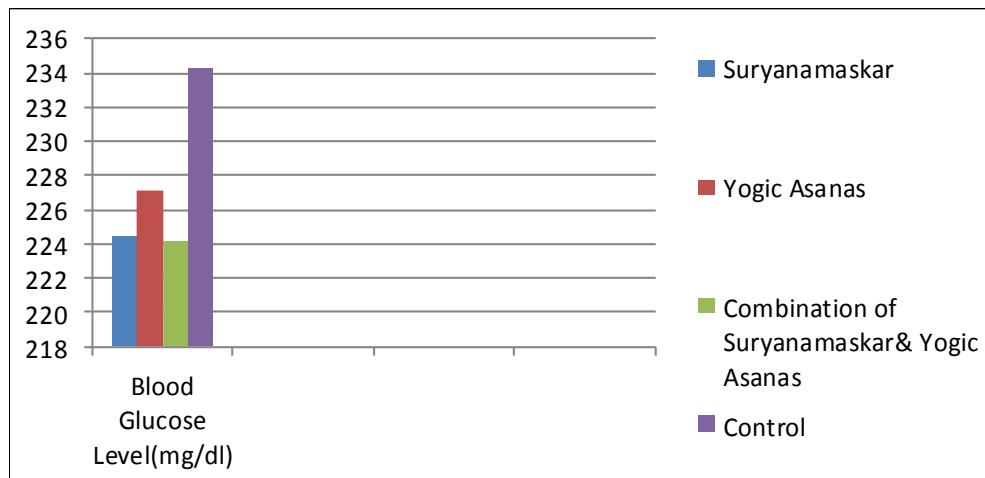
S group	YA group	SYA group	Control group	Mean difference	Critical difference
224.37	227.07			2.7*	0.37
224.37		224.17		0.2	0.37
224.37			234.27	9.9*	0.37
	227.07	224.17		2.9*	0.37
	227.07		234.27	7.3*	0.37
		224.17	234.27	10.1*	0.37

*Significant at 0.05 level = 0.37

(S = Suryanamaskar group; YA = Yogic asana group; SYA = Suryanamaskar & Yogic asana group and C = Control group)

It is clearly evident from table -2 that the adjusted post-test mean differences in between all the groups were higher than the critical difference 0.37. Except Suryanamsaskar Group and Combination of Suryanamsaskar & Yogic Asana Group's mean differences was lesser than the critical difference 0.37 required to be significant at 0.05 level. The findings implies overwhelm that combination of Suryanamsaskar & Yogic

Asanas had decreased Blood Glucose Level for Diabetic Type-II patients more than Suryanamaskar and followed by Yogic Asanas after twelve weeks of Practice. The graphical representation of mean comparison of Blood Glucose level for Diabetic Type II patients of three experimental groups and control group after twelve weeks of experimental treatment is presented in Figure 1.

**Fig 1:** Mean comparison of blood glucose level for diabetic type II patients of three experimental groups and control group after twelve weeks of experimental treatment

Discussion

The analysis of the results of the study reveal that in the case of the experimental group, Suryanamaskar, Yogic Asanas & the Combination of Suryanamaskar and Yogic Asanas have significantly and differently effected in the reduction of Blood Glucose Level in Type II Diabetic patients. The Suryanamaskar and Yogic Asanas cause body muscles to absorb the excess glucose in the blood, thereby reducing the blood glucose level. They help the pancreas and liver to

function effectively, which regulates the blood glucose levels. They help in rejuvenating the pancreatic cells, thereby assisting insulin secretion. The muscular movements also help in bringing down the blood glucose levels. The Suryanamaskar consists of 12 positions that move the spine in various ways and promote flexibility of the limbs. Yogic Asanas induce relaxation, which also plays a key role in the healthy functioning of the internal organs of the body. Yogic asanas are perhaps the only exercises that bring us close to the

inner being or the soul, which is essentially spiritual in nature. In the case of the control group, no changes were noticed in the selected variable during the same period.

They provide a moral foundation for a healthy and harmonious inter personal relationship. Thus, null hypothesis was rejected, since significant changes were seen in the experimental group, the twelve weeks of Suryanamaskar, Yogic Asanas & the Combination of Suryanamaskar and Yogic Asanas programmes have significantly and differently effected in the reduction of Blood Glucose Level in Type II Diabetic patients.

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