



ISSN: 2456-0057
IJPNPE 2018; 3(1): 431-433
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www.journalofsports.com
Received: 30-04-2018
Accepted: 29-05-2018

A Amrose Fathima
Research Scholar, Centre for
Yoga Studies, Annamalai
University, Chidambaram, Tamil
Nadu, India

Dr. K Sekar Babu
Assistant Professor, Research
Guide, Department of Physical
Education, Annamalai
University, Chidambaram, Tamil
Nadu, India

Impact of yogic practices on blood glucose level of Type-2 diabetes

A Amrose Fathima and Dr. K Sekar Babu

Abstract

Introduction: The percentage of diabetic patients all over the world is increasing day by day. Diabetes is the third widespread and serious disease after heart disease and cancer. Lifestyle diseases characterize those diseases whose occurrence is primarily based on the daily habits of people and are a result of an inappropriate relationship of people with their environment. The main factors contributing to lifestyle diseases include bad food habits, physical inactivity, wrong body posture, and disturbed biological clock. A report, jointly prepared by the World Health Organization (WHO) and the World Economic Forum, says India will incur an accumulated loss of \$236.6 billion by 2015 on account of unhealthy lifestyles and faulty diet. Yoga is microcellular in its action. At the internal organs are massaged, sensitivity to insulin and uptake of sugar are enhanced.

Objectives: To observe the blood glucose level variation among practitioners and non-practitioners of yoga and propose yoga as a better method to manage blood glucose level in type 2 diabetics female.

Materials and methods: The study was conducted in 22 type-2 diabetics' female patients from various places in Dindigul town, Tamil Nadu were selected as subjects and they were divided into two equal group namely experimental and control groups. Than the yogic practices

Results: The obtained data from the experimental and control groups, before and after the experimental period were statistically analyzed with analysis of covariance (ANCOVA). The level of confidence was fixed at 0.05 level for all the cases to test the significance. After intervention with yoga for eight weeks the study group showed a significant the reduction in blood glucose level from 168.45 to 138.55 mg/dl was however proved to be significant statistically.

Conclusion: These findings suggest that blood glucose level of diabetics may benefit from yogic practice to reduce the blood glucose level.

Keywords: Diabetic, yogic practice, blood glucose level

Introduction

"Anyone who practices can obtain success in yoga but not one who is lazy. Constant practice alone is the secret of success." Hatha Yoga Pradipika.

The population in India is an increased susceptibility to diabetes mellitus. The prevalence of diabetes in adults was found to be 2.4 in rural and 4.0-11.6% in urban dwellers. High frequencies of impaired glucose tolerance shown by those studies ranging from 3.6-9.1% indicates the potential for further rise in prevalence of diabetes mellitus in the coming decades. The continued presence of troubling symptoms of diabetes mellitus are hyperglycemia hypoglycemia, Fatigue, Polyuria, Polydipsia, blurred vision, stress, anxiety and depression. The stress management strategies includes exercises, yoga, health education on dietary management, lifestyle modification, self-monitoring of blood glucose and self-administration of insulin to decrease fatigue, to maintain normal glucose level and to prevent stress among patient with diabetes mellitus. A similar finding was reported in the potential beneficial impact of following IDF (International Diabetic Federation) recommendations in the management of diabetes. Mayor (2007) [7] has rated IDF as a significant positive influence in drawing the attention of global policy makers on the incidence and steps required to control the growth rate of diabetes. Yoga brings harmony in body and mind, and keeps the person health, both physically and mentally. Literature survey indicates that effective control of diabetes; both Insulin Dependent Diabetes Mellitus and Non-Insulin dependent diabetes Mellitus can be achieved by yoga practice.

Correspondence

A Amrose Fathima
Research Scholar, Centre for
Yoga Studies, Annamalai
University, Chidambaram, Tamil
Nadu, India

Aims and Objectives

Diabetes mellitus is a chronic disease with which the patient must live his life. To achieve a state of health and acceptable level of function, patient with diabetes mellitus need to have adequate knowledge and attitude of self-care activities. They need to clear their doubts related to self-care activities such as diet, exercise, medication, self-administration of insulin, foot care and follow up. To lead an independent life, the diabetic individuals should be a controller of his own life. It is estimated 30 people in India are affected by diabetes and India is the country with highest rate of diabetes. The who estimated the India would be the home for 57 million diabetes by 2025.

Materials and Methods

The selection of subjects, variables, training procedure and statistical techniques are explained below. Recruitment was done through public announcements made at different yoga therapy centers and advertisements. Those volunteers who fulfilled the inclusion criteria were selected for the study. The signed informed consent of subjects was obtained before the data recording. The sample size 22 female from various places in Dindigul town, Tamil Nadu selected as subjects for this study. They are divided into two groups experimental

group the patients with type two diabetes, on allopathic medication with yoga relearning and control group the patients with type two Diabetes, on allopathic medication. The blood glucose level were estimated following standard techniques by glucose oxidase method. Experimental group were taught the following yogic practices such as Pawanamuktasana, sarvangasana, matsyasana, dhanurasana, paschimottanasana, ustrasana, vakrasana, padhasthasana, ardhachakrasana and savasana. Pranayama abdomen breathing, nadisudhi and bhmrari.

Statistical Procedure

The collected data from control and experimental groups prior to and after experimentation on blood glucose level were statistically examined for significant differences, if any by applying the analysis of covariance (ANCOVA). The level of confidence was fixed at 0.05 level for all the cases to test the significance.

Results

The data collected during pre and post-tests among experimental and control groups on blood glucose level have been analyzed statistically and the results are shown in table-I.

Table 1: Analysis of Covariance for Pre- and Post-Test Data on Blood Glucose Level among Experimental and Control Groups

	Experimental Group	Control Group	So V	Sum of Squares	df	Mean Square	'F'-ratio
Pre-Test							
Mean	168.45	170.55	B:	24.05	1	24.05	0.21
S.D	10.90	10.34	W:	2257.45	20	112.87	
Post-Test							
Mean	138.55	169.00	B:	5101.14	1	5101.14	42.32*
S.D	11.24	10.71	W:	2410.73	20	120.54	
Adjusted Post-Test							
Mean	138.56	168.98	B:	5035.32	1	5035.32	39.70*
			W:	2410.04	19	126.84	

*Significant at 0.05 level of confidence

(The table value required for significance at 0.05 level with df 1 & 20 and 1 & 19 are 4.35 and 4.38 respectively.)

The table-I shows that, the pre-test mean values of experimental and control groups on blood glucose level are 168.45 and 170.55. The obtained F-ratio value 0.21 is lower than the required table value of 4.35 with degree of freedom (df) 1&20 at 0.05 level of confidence. Hence, there was no significant difference among experimental and control groups on blood glucose level before the commencement of yogic practices. Further the table-I shows that, the post-test mean values of experimental and control groups on blood glucose level are 138.55 and 169.00. The obtained T-ratio value 42.32 is higher than the required table value of 4.35 with degree of freedom (df) 1&20 at 0.05 level of confidence. It reveals that the significant variations between control and experimental groups on blood glucose level at the end of training

programme.

Table-I further shows that the adjusted post-test mean values for experimental group is 138.56 and control group is 168.98, which have an 'F' ratio of 39.70 and it is higher than the table value of 4.38 required for df 1 and 19 at 0.05 level of significance. It is found that significant differences exist between groups on blood glucose level after adjusting the initial mean differences. It showed that, the experimental group has significant improvement in blood glucose level when compared to the control group.

The pre, post and adjusted post-test mean values of control and experimental groups on blood glucose level are graphically represented in Figure- I.

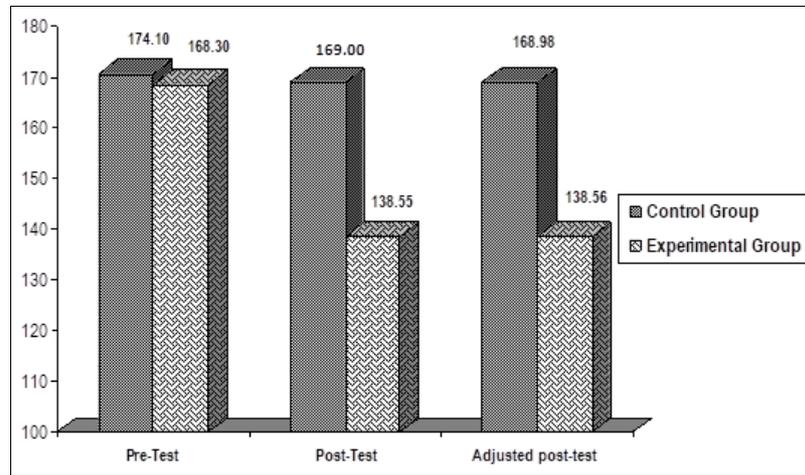


Fig 1: The Pre, Post and -Test Mean Values of Control and Experimental Groups

Discussion

The results of the study reveal that there was significant change in blood glucose level experimental group as compared to control group after completion of the training period.

Yoga and other kinds of meditative physical activity may do some measurable good against stress. Kiecolt-Glaser *et al.*, (2014)^[8] found signs of this when they compared 50 women – experts and beginners in yoga and he was looking at blood chemicals such as interleukin-6 that are associated with stress – and with risks of conditions such as heart disease and diabetes. Regular practice of yoga reduces the risk of diabetes and yoga can even cure diabetes. Doctors all over the world recommend diabetes patients to practice yoga. The yoga exercises that suit for diabetics differ from normal healthy yoga. The exercises should be customized for diabetics and it should involve stretching exercises, relaxation exercises and meditation. Yoga to improve or develop one's inherent power in a balanced manner. It offers the means to attain complete self-realization. The literal meaning of the Sanskrit word yoga is "yoke." Yoga can therefore be defined as a means of uniting the individual spirit with the universal spirit of God. Yoga and yogic processes have been used as an effective medium for prevention of disease and treatment of certain kinds of diseases.

The following studies Amita *et al.*, (2009)^[1] has proved that the yoga-nidra practices reduced blood glucose level in diabetic patients, Innes and Vincent, (2007)^[2] have stated that the yoga-based programs influenced to maintain the risk profiles in adults with type 2 diabetes, Jyotsna, (2014)^[3] has showed that the yoga practices maintain blood glucose in 2 diabetes mellitus, Kumar, (2012)^[4] 'yogic training degreased serum glucose level on diabetics, Rajan (2014)^[9] evidenced that paschimottānāsana and śavāsana training reduced serum glucose level in diabetic patients, Malhotra *et al.*, (2004)^[5] resulted that the effect of yoga asanas and pranayama programme sustained glucose level in non-insulin dependent diabetes mellitus, both articles of Savita and others, (2008)^[10] and Singh *et al.*, (2008)^[11] occasioned that the pranayamas and yoga-asanas influenced blood glucose in type 2 Diabetes. Moreover, Malhotra *et al.*, (2002)^[6] and Mayor, S. (2007)^[7] findings are subsequently support this study.

Conclusions

It can be concluded from this study that the chosen yogic practices are very effective in reducing the blood glucose level seen in type-2 diabetic women patient. There is a lot of

benefits practicing yoga there is scope for future work in this field to preventing, controlling and curing diabetes.

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