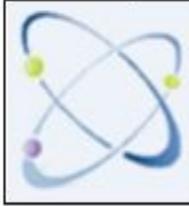


EFFECT OF YOGIC PRACTICES ON SELECTED BIO-CHEMICAL VARIABLES AMONG DIABETIC MEN



HEALTH SCIENCE

Keywords: Yoga, Fasting Blood Sugar, Post Prandial Blood Sugar and Diabetes

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ABSTRACT

The present study was designed to find out the effect of Yogic Practices on selected Bio-chemical variables among Diabetic Men. It was hypothesized that there would be significant differences in fasting blood sugar and post prandial blood sugar among diabetic men due to the influences of Yogic Practices. To achieve the purpose of the study, 40 Diabetic men from Chennai city aged between 30 to 45 years were selected randomly and divided into two groups, one experimental group and one control group of 20 each. Experimental group (A) underwent yogic practices for the period of 8 weeks, six days per week for the maximum of an hour. The control group was not exposed to any specific training but in active rest. The pre and post-test were conducted before and after the training for the above two groups. Fasting and post prandial blood sugar tested through lab tests. The data pertaining to the variables collected from the two groups before and after the training periods were statistically analyzed by using Analysis of Covariance (ANCOVA) to determine the significant difference and tested at 0.05 level of significance. The results of the study showed that fasting blood sugar and post prandial blood sugar were significantly reduced due to the influence of eight week training of Yogic Practices than the control group among diabetic men. The hypothesis was accepted at 0.05 level of confidence. Yogic group showed significant difference than the control group in reducing fasting blood sugar and post prandial blood sugar among diabetic men. The conclusion is that yogic practices could be beneficial in reducing fasting blood sugar and post prandial blood sugar among Diabetic men.

I. INTRODUCTION

Diabetes is a chronic disease that occurs when the pancreas does not produce enough insulin, or when the body cannot effectively use the insulin it produces. Hyperglycemia, or raised blood sugar, is a common effect of uncontrolled diabetes and over time leads to serious damage to many of the body's systems, especially the nerves and blood vessels. Diabetes mellitus is the disease which has prolonged problem for centuries through its incidence at present, especially in the more developed areas of the world, is higher than it has ever been in the past. The reason for this is sedentary life due to technological achievement, both stress and affluence have become increasingly widespread. People have developed the tendency to avoid strenuous physical exercises and overeat. Thus recent flourishing of diabetes can be considered to be a side effect of this century, technological age, pollution on personal level reflecting global pollution. At present, modern science holds that there is no positive system of cure for diabetes mellitus. The most it can offer is control of the symptoms through dietary controls and daily use of insulin and other drugs. The disease itself, however, is commonly not affected by this, and may even increase in severity. The ancient science of yoga is the most successful method of management which originated thousands of years back. It is based upon the internal readjustment of the physical organism through stimulation of the body's own regenerative process. After many years of successfully dealing with sufferers of

diabetes through implementing the internal yogic system, we wish to make the knowledge of these efficacious techniques available to all interested sufferers and therapists of diabetes in the world.

Diabetes in India

In rural areas, the prevalence is approximately 3 percent of the total population. The population of India is now more than 1000 million: this helps to give an idea of the scale of the problem. The estimate of the actual number of diabetics in India is around 63 million. This means that India actually has the highest number of diabetics of any one country in the entire world. So India is genuinely facing a healthcare crisis. Type 1 is considerably more rare, and only about 1/3 of type II diabetics are overweight or obese. Diabetes is also beginning to appear much earlier in life in India, meaning that chronic long-term complications are becoming more common. Worldwide 382 million people have diabetes in 2013. Total deaths from diabetes are projected to rise by more than 50% in the next 10 years the number of people with type 2 diabetes is increasing in every country.

Complications of Diabetes

People with diabetes have an increased risk of developing a number of serious health problems. Consistently high blood glucose levels can lead to serious diseases affecting the heart and blood vessels, eyes, kidneys, nerves and teeth. In addition,

people with diabetes also have a higher risk of developing infections. In almost all high-income countries, diabetes is a leading cause of cardiovascular disease, blindness, kidney failure, and lower limb amputation. Yoga can be a meaningful and enjoyable alternative to traditional forms of exercise such as aerobics or aquatic exercise with important health benefits. Yoga can play an important and effective role in controlling diabetes and increasing positive feelings and wellbeing.

II .PURPOSE OF THE STUDY

The present study was designed to find out the effect of Yogic Practices on selected Bio-chemical variables among Diabetic Men.

Hypothesis

It was hypothesized that there would be significant differences between Yogic Practices (group-A) and Control Group(group-B) on Fasting Blood Sugar and Post Prandial Blood Sugar among Diabetic men.

Delimitations

The following delimitations were taken into consideration in the interpretation of results.

- The study was confined to type II diabetes only.
- The study was confined to type II male diabetes only.
- Subjects were selected from various hospitals and clinics in Chennai city only.
- The age group of the subject was ranged from 30 to 45 years only.
- The study was delimited to eight weeks only.
- The study was restricted to the selected bio-chemical parameters such as fasting blood sugar and post prandial blood sugar only.
- The independent variable would be yogic practices.

Limitations

- The other treatments taken by the patient were not taken into account.
- The patients' way of life style was not considered.
- During the treatment period patients' occupation and their daily activities were not considered.
- Certain factors like diet, environmental and climatic conditions were not considered.
- Drugs taken by the subjects were not taken into account.

III .REVIEW OF RELATED LITERATURE

Madanmohan, et.al. *Int J Yoga*. 2012 Jan;5(1):10-5. Effect of yoga therapy on reaction time, biochemical parameters and wellness score of pre and post-menopausal in diabetic patients. Yogic practices may aid in the prevention and management of diabetes mellitus (DM) and reduce cardiovascular complications in the population. The present study has been undertaken to evaluate the effect of yoga therapy on reaction time, biochemical parameters and wellness score of pre and post-menopausal diabetic patients. 15 pre and post-menopausal patients receiving standard medical treatment for type 2 DM were recruited and reaction time and biochemical investigations were done before and after a

comprehensive yoga therapy program comprising of three times a week sessions for six weeks. A post-intervention, retrospective wellness questionnaire compiled by ACYTER was used to evaluate the comparative feelings of the patients after the therapy program. Yoga training reduced auditory reaction time (ART) from right as well as left hand, the decrease being statistically significant ($P < 0.05$) for ART from the right hand. There was a significant ($P < 0.01$) decrease in fasting and postprandial blood glucose levels as well as low density lipoprotein. The decrease in total cholesterol, triglycerides, and very low density lipoprotein and increase in high density lipoprotein was also statistically significant ($P < 0.05$). All the lipid ratios showed desirable improvement with a decrease ($P < 0.01$) of TC/HDL and LDL/HDL ratios and increase ($P < 0.05$) in the HDL/LDL ratio. Shortening of RT implies an improvement in the information processing and reflexes and is the first such report in diabetic patients. This has clinical significance and is worth further exploration with wider, well controlled, randomized studies in the diabetic population. Changes in blood glucose levels may be due to improved insulin sensitivity, decline in insulin resistance and increased sensitivity of the pancreatic β cells to glucose signals. Yoga improved the 'heart friendly' status of lipid profile in our subjects and as our participants were pre and post-menopausal, the decrease in cardiovascular risk profile is of greater significance. A comprehensive yoga therapy program has the potential to enhance the beneficial effects of standard medical management of diabetes mellitus and can be used as an effective complementary or integrative therapy program. Singh S, et.al, (2004), studied the effect of forty days of Yogic exercises on cardiac functions in Type 2 Diabetics studied the effect of forty days of Yogic exercises on blood glucose level, glycosylated hemoglobin. The present study done in twenty-four Type 2 DM cases provides metabolic and clinical evidence of improvement in glycaemic control and autonomic functions. These middle-aged subjects were type II diabetics on antihyperglycaemic and dietary regimen. Their baseline fasting and postprandial blood glucose and glycosylated Hb were monitored along with autonomic function studies. The expert gave these patients training in yoga asanas and they pursued those 30-40 min/day for 40 days under guidance. These asanas consisted of 13 well known postures, done in a sequence. After 40 days of yoga asanas regimen, the parameters were repeated. The results indicate that there was significant decrease in fasting blood glucose levels from basal 190.08 ± 18.54 in mg/dl to 141.5 ± 16.3 in mg/dl after yoga regimen. The post prandial blood glucose levels decreased from 276.54 ± 20.62 in mg/dl to 201.75 ± 21.24 in mg/dl, glycosylated hemoglobin showed a decrease from $9.03 \pm 0.29\%$ to $7.83 \pm 0.53\%$ after yoga regimen. The pulse rate, systolic and diastolic blood pressure decreased significantly (from 86.45 ± 2.0 to 77.65 ± 2.5 pulse/min, from 142.0 ± 3.9 to 126.0 ± 3.2 mm of Hg and from 86.7 ± 2.5 mm of Hg to 75.5 ± 2.1 mm of Hg after yoga regimen respectively). Corrected QT interval (QTc) decreased from 0.42 ± 0.0 to 0.40 ± 0.0 . These findings suggest that better glycaemic control and stable autonomic functions can be obtained in Type 2 DM cases with yoga asanas and

pranayama. The exact mechanism as to how these postures and controlled breathing interact with somato-neuro-endocrine mechanism affecting metabolic and autonomic functions remains to be worked out.

IV .METHODOLOGY

For the present study 40 Diabetic working men aged between 30 – 45 years were selected as the subjects from Chennai. All the subjects were assigned to one experimental group (Group A) and one control group (B), each consisting 20 subjects. The experimental group practiced the above weekly six days for a period of eight weeks. Group-A underwent yogicpractices (N-20) and Group-B acted as control group. Yogic practices given to the experimental Group-A were included Loosening Exercises, Suryanamaskar, Sarvangasana, Halasana, Matsyasana, Naukasana, Bhujangasana, Yogamudras, Paschimottanasana, Salabasana, Dhanurasana, Pawanamukthasana, Ardhamatsyendrasana, Savasana and Pranayama like Kapalbathi and Nadisuddhi. BrahmariandUjjayi.

Fasting and Post Prandial Blood Sugar was tested through lab tests.

V .RESULTS AND DISCUSSIONS

The data pertaining to the variables collected from the two groups before and after the training period were statistically analyzed by using Analysis of Covariance (ANCOVA) to determine the significant difference and tested at 0.05 level of significance. The Analysis of Covariance (ANCOVA) on Fasting blood sugar of Yogic Practices(Group-A) and Control Group (Group-B) was analyzed and are presented in table – I:

Table – I: Analysis of Co-Variance of the Means of Experimental Group and Control Group in Fasting Blood sugar

	Exp. Group	Control Group	Source of Variance	Sum of Squares	Df	Mean Squares	Obtained F-ratio
Pre Test Mean	147.200	136.650	Between	1113.025	1	1113.025	2.826494
			Within	14963.75	38	393.7829	
Post Test Mean	117.000	139.550	Between	5085.03	1	5085.025	12.43206
			Within	15542.95	38	409.025	
Adjusted Post Test Mean	69.21	101.35	Between	9613.688	1	9613.688	111.763
			Within	3182.685	37	86.01851	
Mean difference	30.20	2.90					

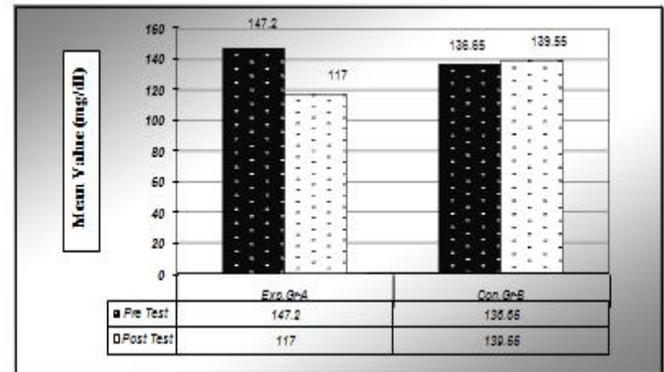
* Significant at 0.05 level of confidence

(Table F ratio at 0.05 level of confidence with df one and 38(df) = 4.08, one and 37(df) = 4.08)

The obtained F value on pre test scores 2.82was lesser than the required F value of 4.08 to be significant at 0.05 level. This proved that there was no significant difference between the groups a pretest and posttest and the randomization at the pretest was equal. The post test scores analysis proved that there was significant difference between the groups, as obtained F value 12.43was greater than the required F value of 4.08. This proved that the differences between the post test means of the subjects were significant. Taking into

consideration the pre and post test scores among the groups adjusted mean scores were calculated and subjected to statistical treatment. The obtained F value of 111.76was greater than the required F value of 4.08. This proved that there was a significant difference among the means due to six weeks of Yogic practices on Fasting blood sugaras in line with the study conducted by Madanmohan, et.al. (2012) and Singh S, et.al, (2004). The ordered adjusted means on Fasting blood sugar were presented through bar diagram for better understanding of the results of this study in Figure - 1.

Figure-I: Bar DiagramShowing the Mean DifferenceamongYogic Practices(Group A)and Control Group(Group B)onFasting Blood Sugar



* Significant at 0.05 level of confidence

The results of the study showed that Fasting blood sugarreduced significantly as a result of Yogic Practices (Group-A). Hence the hypothesis was accepted at 0.05 level of confidence. The Analysis of Covariance (ANCOVA) on Post Prandial Blood Sugar of Yogic Practice (Group-A) and Control Group (Group-B) was analyzed and are presented in table – II:

Table – II: Analysis of Co-Variance of the Means of Experimental Group and Control Group inPost Prandial Blood Sugar

	Exp. Group	Control Group	Source of Variance	Sum of Squares	Df	Mean Squares	Obtained F-ratio
Pre Test Mean	229.300	224.350	Between	245.025	1	245.025	0.133317
			Within	69840.75	38	1837.914	
Post Test Mean	186.200	240.000	Between	28944.40	1	28944.4	10.9134
			Within	100783.18	38	2652.189	
Adjusted Post Test Mean	107.43	166.22	Between	34446.18	1	34446.18	42.90857
			Within	29702.9	37	802.781	
Mean difference	43.10	15.65					

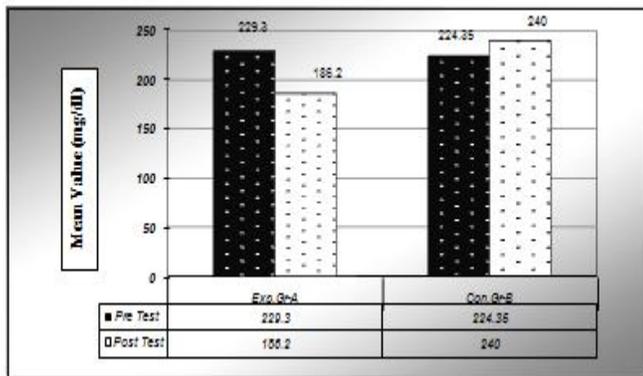
* Significant at 0.05 level of confidence

(Table F ratio at 0.05 level of confidence with df one and 38(df) = 4.08, one and 37(df) = 4.08)

The obtained F value on pre test scores 0.133was lesser than the required F value of 4.08 to be significant at 0.05 level. This proved that there was no significant difference between the groups a pretest and posttest and the randomization at the pretest was equal. The post test scores analysis proved that there was significant difference between the groups, as

obtained F value 10.91 was greater than the required F value of 4.08. This proved that the differences between the post test means of the subjects were significant. Taking into consideration the pre and post test scores among the groups adjusted mean scores were calculated and subjected to statistical treatment. The obtained F value of 42.90 was greater than the required F value of 4.08. This proved that there was a significant difference among the means due to six weeks of Yogic practices on Systolic Post Prandial Blood Sugar as in line with the study conducted by Madanmohan, et.al. (2012) and Singh S, et.al, (2004). The ordered adjusted means on Post Prandial Blood Sugar were presented through bar diagram for better understanding of the results of this study in Figure - 2.

Figure-2: Bar Diagram Showing the Mean Difference among Yogic Practices (Group A) and Control Group (Group B) on Post Prandial Blood Sugar



* Significant at 0.05 level of confidence

The results of the study showed that Post Prandial Blood Sugar reduced significantly as a result of Yogic Practices (Group-A). Hence the hypothesis was accepted at 0.05 level of confidence.

CONCLUSION

Based on the results obtained, the following conclusion was drawn:

It was concluded that Yogic Practices (Group-A) showed significant difference and thus beneficial in reducing Fasting Blood Sugar and Post Prandial Blood Sugar among Diabetic men.

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