Effects of Varied Yogic Practices on Selected Bio-Chemical Variables among Diabetic Patients

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Abstract

The present study was designed to find out the effects of varied yogic practices on selected Bio-chemical variables among diabetic patients. It was hypothesized that there would be significant differences on Bio-chemical variables such as blood sugar among diabetic patients due to the influences of yogic practices. To achieve the purpose of the study, 60 diabetic patients from Trichy city aged between 40 to 50 years were selected randomly into two experimental and one control groups of 20 each. Experimental group (A & B) underwent yogic practices for the period of 6 weeks, six days per week for the maximum of an hour in morning. The control group was not exposed to any specific training. The pre and post-test were conducted before and after the training for above three groups. The blood sugar was measured by glucometer. The data pertaining to the variables collected from the three 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 results of the study showed that blood sugar reduced significantly as a result of yogic practices of package B. Hence, the hypothesis was accepted at 0.05 level of confidence. The conclusion is that the yogic practices of package B helped to reduce the blood sugar level among diabetic patients.

Keywords: Yoga, Blood sugar, Diabetes mellitus.

Introduction

In 2011, India had 62.4 million people with type 2 diabetes, compared with 50.8 million the previous year, according to the International Diabetes Federation (IDF) and the Madras Diabetic Research Foundation. As the economy started growing, so did the incidence of diabetes. By 2030, the IDF predicts, India will have 100 million people with diabetes.

"The physical activities have reduced. Also, due to large population size there is higher probability of acquiring diabetes through certain genes," Mbanya said at the fifth Asian consensus meeting.

Diabetes mellitus, often simply referred to as diabetes—is a group of metabolic diseases in which a person has high blood sugar, either because the body does not produce enough insulin, or because cells do not respond to the insulin that is produced. This high blood sugar produces the classical symptoms of polyuria (frequent urination), polydipsia (increased thirst) and polyphagia (increased hunger).

Yoga not only complements the lifestyle changes which are required to keep the diabetic symptoms under control, but also helps a lot in creating a life that is full of happiness and vitality.

Yoga poses helps to normalize (not reducing, which may lead to hypoglycemia) blood sugar level by stimulating the internal organs responsible for the carbohydrate metabolism.

Objectives of the Study

1. The objective of the study was to find out the impact of the selected Suryanamaskar, Asanas, Pranayama practices on diabetic patients.

2. To find out the effect of selected yogic practices on the selected Bio-chemical variables on diabetic patients.

Reasons for the Selection of the Topic

The researcher has taken interest on the isolated and combined effect of varied asana and pranayama practices on selected biochemical variables among diabetic patients.

Bio-chemical variable are needed to analyze the various changes takes place in their physical level after the training period.

The researcher took this topic because there are lack of literature and studies in the same fields, and especially on for diabetic patients. Hence Researcher wants to find out the effect of each practices separately and combine practices on diabetic patients, they feel control the diabetes.

Reasons for the Selection of the Variables

The researcher has chosen biochemical variables (blood sugar and total cholesterol) because these are the health related variables affect diabetic patients.

Statement of the Problem

The purpose of the study was to find out the effect of varied yogic practices on selected Bio- chemical variables among diabetic patients.

Hypothesis

1. It was hypothesized that there would be significant differences in Experimental groups (group A and group B) than control group (group C) on selected Bio-chemical variables among diabetic patients.

2. It was hypothesized that there would be significant differences in yogic practices of group A as well as group B on selected Bio-chemical variables among diabetic patients.

Delimitations

The study was delimited to the following:

1. The study was confined to diabetic patients only.
2. This study was restricted to the patients Diabetic patients residing at Trichy city only.
3. The age groups of the subjects were between 40 to 50 years only.
4. This study was restricted to 20 diabetic patients in each group only.
5. The independent variables were Suryanamaskar, asanas and pranayama practices only.
6. The dependent variables were resting blood sugar level and total cholesterol level (bio-chemical) only.

Limitations

The following uncontrollable factors associated with the study where accounted as limitations of this study:

1. Diet and previous training are not to be considered.
2. The quantum of physical, life style and physiological stress and other factors that affect the metabolic function were also considered as limitation.
3. The uncontrollable changes in climatic conditions such as atmospheric temperature, humidity and other factors during the period of testing where considered as limitations.
4. The socio-economical status was not taken into consideration

Review of Related Literature

Malhotra, et.al, (2005), selected twenty NIDDM subjects (mild to moderate diabetics) in the age group of 30-60 years from the outpatient's clinic of G.T.B. hospital. They were on a 40 days yoga asana regime under the supervision of a yoga expert. 13 specific Yoga asanas < or = done by Type 2 Diabetes Patients included. Surya Namaskar, Trikonasana, Tadasana, Sukhasana, Padmasana, Bhastrika Pranayama, Pashimottanasana, Ardhmatsyendrasana, Pawanmuktasana, Bhujangasana, Vajrasana, Dhanurasana and Shavasana are beneficial for diabetes mellitus. Serum insulin, plasma fasting and one hour postprandial blood glucose levels and anthropometric parameters were measured before and after yoga asanas. The results indicate that there was significant decrease in fasting glucose levels from basal 208.3 +/- 20.0 to 171.7 +/- 19.5 mg/dl and one hour postprandial blood glucose levels decreased from 295.3 +/- 22.0 to 269.7 +/- 19.9 mg/dl. The exact mechanism as to how these postures and controlled breathing interact with somatoendocrine mechanism affecting insulin kinetics was worked out. A significant decrease in waist-hip ratio and changes in insulin levels were also observed, suggesting a positive effect of yoga asanas on glucose utilization and fat redistribution in NIDDM. Yoga asanas may be used as an adjunct with diet and drugs in the management of Type 2 diabetes.

Methodology

To achieve the purpose of the study, 60 diabetic patients from Trichy were selected as subjects and their aged between 40 to 50 years. All the subjects were assigned to two Experimental groups (Group A and Group B) and one control group (C), each consisting of 20 subjects.

In this study yogic practices were given to Experimental group (A & B) for the period of six weeks, six days per week for the maximum of an hour in the morning. The control group was not given any specific training but they participated in the regular activities.

The yogic practices given to the Experimental group A include Asanas like Trikonasana, Padhahastasan, Vajrasana, Vakrasana, Bhujangasana, Dhanurasana, Januseerasasana, Ardha matsyendrasana, Navasana, Pawanmuktasana , Uttanpadasana , Shalabhasana , Shavasan. Experimental group-B includes Suryanamaskar, Asanas like Trikonasana, Padhahastasan, Vajrasana, Vakrasana, Bhujangasana, Dhanurasana, Januseerasasana, Ardha matsyendrasana, Navasana, Pawanmuktasana , Uttanpadasana, Shalabhasana, Sarvangasana, Halasana, Mathyasana and Pranayama like Nadi shudhi, Ujjayi, Brahmari, Sitali, Kabalabhati

The selected bio-chemical variables, blood sugar were measured by glucometer.

Results and Discussions

The data pertaining to the variables collected from the three 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 Group-B) and control group (Group-C) was analyzed and are presented in table – I:

Table–I

Analysis of Co-variance of the Means of Two Experimental Groups and the Control Group in Fasting Blood Sugar

	Group-A	Group-B	Control Group	Source of Variance	Sum of Squares	Df	Mean Squares	Obtained F-ratio
Pre Test Mean	141.85	147.200	136.65	Between	1113.1	2	556.55	1.41
				Within	22480.3	57	394.39	
Post Test Mean	129.85	117.000	139.55	Between	5118.10	2	2559.05	6.68*
				Within	21815.50	57	382.72	
Adjusted Post Test Mean	129.89	112.26	144.25	Between	9786.11	2	4893.05	71.76*
				Within	3818.00	56	68.17	
Mean Difference	12.00	30.20	2.90					

Table F ratio at 0.05 level of confidence for 2 and 57 (df) = 3.18, 2 and 56 (df) = 3.18, * Significant

The obtained F value on pre test scores 1.41 was lesser than the required F value of 3.18 to be significant at 0.05 level. This proved that there was no significant difference between the groups a pre test and post test and the randomization at the pre test was equal.

The post test scores analysis proved that there was significant difference between the groups, as the obtained F value 6.68 was greater than the required F value of 3.18. 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 71.76 was greater than the required F value of 3.18. This proved that there was a significant difference among the means due to six weeks of Yogic practices on Bio-chemical variables, Fasting Blood Sugar.

Since significant improvements were recorded, the results were subjected to post hoc analysis using Scheffe's Confidence Interval test. The results were presented in table - I (A).

Table – I (A)

Scheffe's Post-Hoc Test for Fasting Blood Sugar

Means			Mean difference	Required C.I
Group-A	Group-B	Control		
129.89	112.26		17.63*	7.57
129.89		144.25	14.35*	7.57
	112.26	144.25	31.99*	7.57

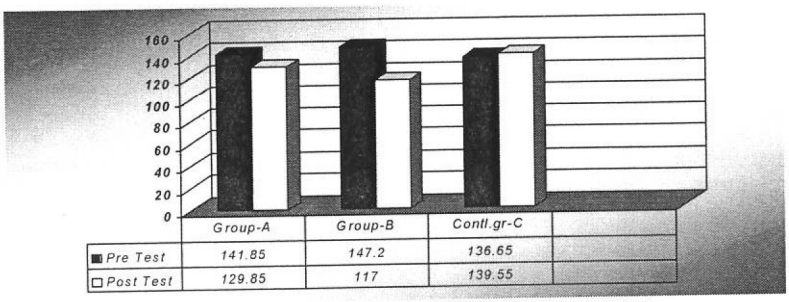
* Significant

The multiple mean comparisons shown in table- I (A) proved that there existed significant differences between the adjusted means of Asana practices (Group A) and control group (Group-C), Suryanamaskar, Asana, Pranayama practices (Group-B) and control group (Group-C). There was significant difference between Asana practices (Group A) and Suryanamaskar, Asana, Pranayama practices (Group-B).

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-1

Bar Diagram Showing the Mean Difference among Yogic Practices and Control Group on Fasting Blood Sugar



The results of the study showed that fasting blood sugar reduced significantly as a result of yogic practices. Hence the hypothesis was accepted at 0.05 level of confidence.

The Analysis of Covariance (ANCOVA) on Post Prandial blood sugar of Yogic practices (Group-A and Group-B) and control group (Group-C) was analyzed and are presented in table – II:

Table–II

Analysis of Co-variance of the Means of Two Experimental Groups and the Control Group in Post Prandial Blood Sugar

	Group -A	Group -B	Control Group	Source of Variance	Sum of Squares	Df	Mean Squares	Obtained F-ratio
Pre Test Mean	216.650	239.200	211.950	Between	8487.7	2	4243.85	2.31
				Within	104470.7	57	1832.819	
Post Test Mean	191.750	187.150	222.200	Between	14512.43	2	7256.217	3.67*
				Within	112468.9	57	1973.149	
Adjusted Post Test Mean	197.05	172.36	231.69	Between	33389.52	2	16694.76	31.70*
				Within	29485.04	56	526.5186	
Mean Difference	24.90	52.05	10.25					

Table F ratio at 0.05 level of confidence for 2 and 57 (df) = 3.18, 2 and 56 (df) = 3.18

* Significant.

The obtained F value on pre test scores 2.31 was lesser than the required F value of 3.18 to be significant at 0.05 level. This proved that there was no significant difference between the groups a pre test and post test and the randomization at the pre test was equal.

The post test scores analysis proved that there was significant difference between the groups, as the obtained F value 3.67 was greater than the required F value of 3.18. 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 31.70 was greater than the required F value of 3.18. This proved that there was a significant difference among the means due to six weeks of Yogic practices on Bio-chemical variables, Post Prandial Blood Sugar.

Since significant improvements were recorded, the results were subjected to post hoc analysis using Scheffe's Confidence Interval test. The results were presented in table - II (A).

Table–II (A)

Scheffe's Post-hoc Test for Post Prandial Blood Sugar

Means			Mean difference	Required C.I
Group-A	Group-B	Control		
197.05	172.36		24.69*	21.05
197.05		231.69	34.63*	21.05
	172.36	231.69	59.33*	21.05

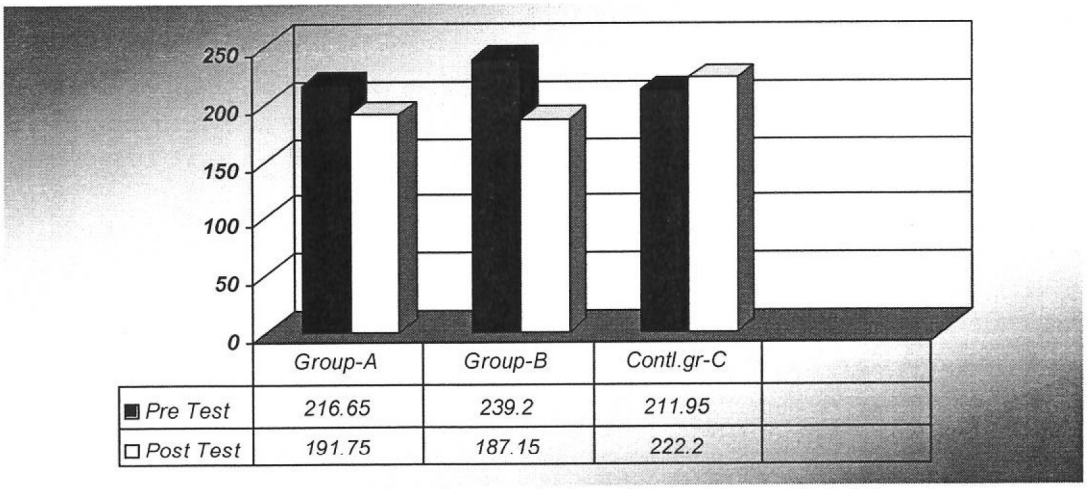
* Significant

The multiple mean comparisons shown in table- II (A) proved that there existed significant differences between the adjusted means of Asana practices (Group A) and control group (Group-C), Suryanamaskar, Asana, Pranayama practices (Group-B) and control group (Group-C). There was significant difference between Asana practices (Group A) and Suryanamaskar, Asana, Pranayama practices (Group-B).

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 and Control Group on Post Prandial Blood Sugar



The results of the study showed that Post Prandial blood sugar reduced significantly as a result of yogic practices. Hence the hypothesis was accepted at 0.05 level of confidence.

Conclusion

Based on the results obtained, the following conclusions were drawn:

1. It was concluded that Fasting blood sugar & Post prandial blood sugar were significantly reduced due to the influences of six week Asana practices (Group-A) and Suryanamaskar, Asana & Pranayama practices (Group-B) than control group C on diabetes patients.

2. It was concluded that Suryanamaskar, Asana & Pranayama practices (Group-B) was slightly effective than Asana practices (Group-A) in reducing Fasting blood sugar & Post prandial blood sugar.

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