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## RESEARCH ARTICLE

### EFFECT OF YOGIC PRACTICES AND PHYSICAL EXERCISES ON BLOOD SUGAR AND URIC ACID AMONG DIABETES WOMEN PATIENTS

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#### ABSTRACT

Prevalence of diabetes is projected to increase to 80 million by 2030, placing an immense burden on the health care resources of our country. The aim of this study was to find out the effect of yogic practices and physical exercises on blood sugar and uric acid among diabetic women patients. 60 women NIDDM patients undergoing treatment in Government Hospitals and Diabetic Centres in Chennai were randomly selected as subjects in the age group of 35 to 45. They were grouped into three based on their mean random blood sugar level, such as control group, experimental group I and experimental group II respectively. Pre tests scores were determined on blood sugar and uric acid based on the blood samples collected. Experimental group I underwent 12 weeks yogic practices, experimental group II underwent 12 weeks physical exercises and control group did not participated in any of the special activity. Immediately after completion of the experimental period, the post tests were conducted on the above said dependent variables, which formed final scores of the subjects. Statistical analysis using ANCOVA proved that experimental treatments significantly contributed to beneficially alter blood sugar (F : 29.42) and uric acid (F: 16.97). Yogic practices were found significantly better than physical exercises in beneficially altering blood sugar and uric acid among diabetic women patients. It was concluded that yogic practices play significant role in regularizing blood sugar and uric acid and yogic practices can be popularized among diabetic patients for treating and managing diabetics especially among women diabetic patients.

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## INTRODUCTION

Patients with diabetes mellitus also have an increased likelihood of lipid abnormalities. Intervention to lower plasma LDL cholesterol to less than 2.6 mmol/l (100 mg/dl) has been recommended. In high-risk diabetic patients with cardiovascular disease, an even lower LDL cholesterol goal of 1.8 mmol/l (70 mg/dl) has been proposed. In spite of these recommendations, a study published in 2003 detected no improvement over a 5-year period in the treatment of hyperlipidemia in patients with type 2 diabetes living in a large urban area. The high incidence of microvascular and macrovascular complications in patients with diabetes dramatically exacerbates the cardiovascular effects of smoking. Unfortunately, smoking cessation is also a difficult behavioral modification to implement. Until the results of the UK Prospective Diabetes Study (UKPDS) became available, it was not known whether stricter blood glucose control would alter the incidence and complication rate of type 2 diabetes

mellitus. The UKPDS enrolled patients at the time of diagnosis of type 2 diabetes and randomly allocated them to dietary intervention or intensive blood glucose control with oral hypoglycemic agents (metformin or insulin). After 9 years of follow-up, a significant reduction in the incidence of microvascular complications (primarily a decrease in the need for laser treatment of diabetic retinopathy) was observed in the intensive as compared with the moderate blood glucose control group. After 15 years of follow-up, however, there was no difference in diabetes-related death rates between the groups. The UKPDS results indicate that factors in addition to blood glucose control must be involved in the development of macrovascular complications in type 2 diabetes, because 75–80% of diabetes-related deaths are due to macrovascular complications. Because 35–40% of patients with type 2 insulin-resistant diabetes are treated with exogenous insulin, it is also worth emphasizing that insulin therapy increases body weight, potentially worsening insulin resistance. Weight loss and physical activity are the most effective means of improving insulin sensitivity in patients with type 2 diabetes. In fact, a prospective, randomized trial has shown that diet-

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related weight loss and physical exercise can each reduce the incidence of diabetes onset in patients with impaired glucose tolerance. Knowler *et al.* (2002) These behavioral approaches to preventing the onset of diabetes or to improving insulin sensitivity in established diabetes are difficult to implement and sustain. iminished exercise capacity, as assessed by peak oxygen consumption (peak VO<sub>2</sub>), was independently associated with an increased incidence of diabetic nephropathy and retinopathy in patients with diabetes without a history of coronary artery disease. Estacio *et al.* (1998) Aswathy *et al.* (2013) documented that the prevalence of Diabetes is projected to increase to 80 million by 2030, placing an immense burden on the health care resources of our country. Thus, diabetes poses a challenge to health systems and the individual. Hence, it is necessary to look at adjuncts to effective management of Diabetes; adjuncts which are not resource intensive and are nearer to the community that people live in. Yoga holds promise as a therapeutic intervention and health promotion measure. This brief communication explores the studies done to date on the beneficial effects of Yoga on Diabetes. Shantakumari *et al.* (2013) assessed the effectiveness of yoga in the management of dyslipidemia in patients of type 2 diabetes mellitus. This randomized parallel study was carried out in Medical College Trivandrum, Kerala, India. The lipid profiles of both the groups were compared at the start and at the end of 3 months. After intervention with yoga for a period of 3 months the study group showed a decrease in total cholesterol, triglycerides and LDL, with an improvement in HDL. Alexander *et al.* (2012) described patterns of yoga practice and examined differences in physical activity over time between individuals with or at risk for type 2 diabetes who completed an 8-week yoga intervention compared with controls. Malhotra *et al.* (2005) made a study on "The beneficial effect of yoga in diabetes". They selected twenty NIDDM subjects (mild to moderate diabetics) in the age group of 30-60 years from the out patient clinic of G.T.B. hospital. They were on a 40 days yoga asana regime under the supervision of a yoga expert. Patients included. Serum insulin, plasma fasting and one hour postprandial blood glucose levels and anthropometric parameters were measured before and after yoga asanas.

A significant decrease in waist-hip ratio and changes in insulin levels were also observed, suggesting a positive effect of yoga asanas on glucose utilisation and fat redistribution in NIDDM. Yoga asanas may be used as an adjunct with diet and drugs in the management of Type 2 diabetes. Sanghani *et al.* (2013) assessed the effect of structured exercise training and unstructured physical activity interventions on glycemic control. Sharma (1995) conducted a programme on Ujjayi and Bhastrika for forty- five minutes in three spells in morning for three months on 150 school children affected by exposure to M.I.C. Gas. Resting pulse rate, vital capacity, blood pressure, haemoglobin percentage and cardio respiratory function as measured by Harvard step test increased to normal rate.

## MATERIALS AND METHODS

Sixty women NIDDM patients undergoing treatment in Government Hospitals and Diabetic Centres in Chennai were randomly selected as subjects in the age group of 35 to 45. They were grouped into three based on their mean random blood sugar level, such as control group, experimental group I and experimental group II respectively. Pre tests scores were determined on blood sugar and uric acid based on the blood samples collected. Experimental group I underwent 12 weeks yogic practices, experimental group II underwent 12 weeks physical exercises and control group did not participated in any of the special activity. Immediately after completion of the experimental period, the post tests were conducted on the above said dependent variables, which formed final scores of the subjects. The difference between initial and final scores was considered as the effect of respective treatment. To test statistical significance, ANCOVA was used. In all cases 0.05 level was fixed to test the hypothesis of this study.

## RESULTS

The collected data were analysed to find out the effect of yogic practices and physical exercises on blood sugar and uric acid separately among NIDDM women patients. The obtained results are presented in Table I

**Table 1. Effect of Yogic Practices and Physical Exercises on Blood Sugar and Uric Acid among NIDDM Women Patients**

Tests	MEANS OF			Source of Variance	Sum of Squares	df	Mean Squares	Obtained F
	PE Group	YP Group	Control Group					
Results on blood sugar								
<b>Pre Test</b>	228.30	229.70	227.55	Between	47.63	2	23.82	
				Within	3383.35	57	59.36	0.40
<b>Post Test</b>	221.65	218.90	227.20	Between	715.03	2	357.52	
				Within	3945.55	57	69.22	5.16*
<b>Adjusted Post Test</b>	221.85	217.80	228.10	Between	1063.66	2	531.83	
				Within	1012.25	56	18.08	29.42*
<b>Mean Diff</b>	-6.65	-10.80	-0.35					
Results on uric acid								
<b>Pre Test</b>	4.12	4.16	4.14	Between	0.02	2	0.01	
				Within	16.71	57	0.29	0.03
<b>Post Test</b>	4.30	3.98	4.13	Between	1.03	2	0.51	
				Within	13.52	57	0.24	2.16
<b>Adjusted Post Test</b>	4.31	3.96	4.13	Between	1.26	2	0.63	
				Within	2.08	56	0.04	16.97*
<b>Mean Diff</b>	0.18	0.18	0.01					

PE: Physical Exercises YP: Yogic Practices

Table F-ratio at 0.05 level of confidence for 2 and 57 (df)=3.16, 2 and 56 (df)=3.16.

\*Significant

**Table 2. Multiple Comparisons of Adjusted Paired Means among Physical Exercises Group, Yogic Practices Group and Control Group on Blood Sugar and Uric Acid**

Variables	MEANS OF			MD	C.I Reqd
	PE Group	YP Group	Control Group		
Blood Sugar	221.85	217.80		4.05*	3.38
	221.85		228.10	6.25*	3.38
		217.80	228.10	10.30*	3.38
Uric Acid	4.31	3.96		0.35*	0.15
	4.31		4.13	0.19*	0.15
		3.96	4.13	0.17*	0.15

PE: Physical Exercise; YP : Yogic Practices

\* Significant

Due to experimental treatments, the blood glucose and uric acid were stabilized while blood sugar reduced by physical exercises and yogic practices and physical exercise increase uric acid while yogic practices reduced uric acid. To test which of the two experimental group was significantly better than the other post hoc analysis was made to compare the paired adjusted means and the results presented in Table II.

## DISCUSSION

Researches showed that physical exercises has been shown to reduce cholesterol levels, have a protective effect from coronary heart disease, reduce body weight, reduce blood pressure and improve circulation in medical patients. Physical exercises after eating have been beneficial in keeping post prandial blood sugars in control for many patients. Many diabetic patients have reduced their medication levels during their tenure in their walking programme. (Girish and Sridhar, 2007) The effect of physical exercises and yogic practices on blood sugar and uric acid among diabetics women patients were studied in this article. The results proved that experimental treatments significantly contributed to beneficially alter blood sugar (F : 29.42) and uric acid (F: 16.97). The adjusted mean comparisons through post hoc analysis of results proved that physical exercises and yogic practices significantly altered blood sugar and uric acid compared to control group (P <0.05). Yogic practices were found significantly better than physical exercises in beneficially altering blood sugar and uric acid among diabetic women patients. Thus, results of this study were in agreement with the findings of Alexander *et al.* (2012) and Girish and Sridhar, 2007 who found physical exercises and yogic practices can beneficial for diabetic patients.

## Conclusion

It was concluded that yogic practices play significant role in regularizing blood sugar and uric acid and yogic practices can be popularized among diabetic patients for treating and managing diabetics especially among women diabetic patients.

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