

Original Research

Comparison of effect of yoga on fasting blood sugar level, lipid profile and blood pressure in diabetes patient with addiction and without addiction

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ABSTRACT

Aim: In the present study, an attempt was made to evaluate the beneficial effects of pranayama on glycemic control, hypertension and dyslipidemia between addicted diabetic and non-addicted diabetic patients. **Background:** Diabetes is a global epidemic and it has been posing a biggest threat ever witnessed with devastating human, social and economic consequences. **Materials and Methods:** The study was conducted on 28 male patients suffering from diabetes mellitus Type-II between the age group of 30-60 years, for the period of 6 month at Index Medical College Hospital and Research Centre, Indore. Subject will be practicing yoga or simple pranayama (breathing exercise) for approximately 5 min for a period of 6 months. **Results:** The result of this study suggests that after 6 months of yogic exercises there is a significant decline in fasting blood sugar level of subjects who have no addiction, but lipid profile and blood pressure do not show any significant change either on addicted or non-addicted diabetes patients. The effect of yoga practice on various parameters were recorded and statistically analyzed by paired t-test for evaluation. **Conclusion:** Diabetes mellitus silently progress it compromises the function of many of the system so, people should not delay in achieving the effective control. Yoga can be an adjuvant, but not a replacement for tested and tried medical management of diabetes mellitus Type II.

Keywords: Addiction, diabetes, Pranayama

INTRODUCTION

Main culprit for the development of diabetes mellitus Type II now days are increased sedentary lifestyle. Smoking is known to negatively impact human health. Carcinogenic processes, vasomotor dysfunction, impaired endothelial-dependent vasodilatation, and the modification of lipid profiles are included in this adverse effects.¹

A healthy lifestyle, which includes exercise, is important in the fight against diabetes. Yoga can complement such a lifestyle and help to keep diabetes under control.

Smoking has also been shown to be associated with insulin resistance in both non-diabetic and Type II diabetic subjects. The acute effects of cigarette smoking in smokers

include dyslipidemia and impaired insulin action that leads to abnormal glucose metabolism. Both dyslipidemia and insulin resistance are well-established major risk factor for cardiovascular disease.² However, there is limited information available regarding the effect of smoking cessation on blood glucose control and lipid profiles.

MATERIALS AND METHODS

The study comprised of 28 known diabetic patients aged 35-65 years at Index Medical College Hospital and Research Centre, Indore. The study population was subjected to practice "Yoga", Anulom vilom Pranayama and Kapalbhathi 5 min each daily for a total period of 6 months under

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observation of a yoga instructor. 13 out of 28 diabetic patients are addicted to smoke or tobacco chewing and remaining 15 diabetic patients are non-addicted.

The subjects were informed of aims and objectives of the study:

1. Prior to and during the course of study they will be on their regular course of medication.
2. Subject will act their own control; a separate control group will not be incorporated.
3. Subject will be practicing yoga for a period of 6 months.

Inclusion Criteria

1. Patient is a known case of Type-II diabetes.
2. Subjects not doing any type of physical exercise or yoga.

Exclusion Criteria

1. Subjects having history of complications associated with diabetes or suffering from other disease.
2. Subjects with age <30 years or above 60 years.
3. Female subjects suffering from gestational diabetes.
4. Patient suffering from Type-I diabetes.

PARAMETERS RECORDED

1. Fasting blood sugar
2. Blood lipid profile (Low-density lipoprotein [LDL], High-density lipoprotein [HDL], cholesterol)
3. Blood pressure
 - A. Blood glucose measurement in diabetics:-
 - The “gold standard” for diagnosing diabetes is an elevated blood sugar level after an overnight fast (not eating anything after midnight).
 - Fasting blood glucose sample was taken.
 - Estimation of blood glucose was done in the central lab. The “glucose oxidase-peroxidase” method was used for determining serum glucose.
 - B. Interpretation of fasting blood sugar (FBS):-
According to the 2013 Recommendation of the American diabetes association, fasting blood sugar interpretation is done as:
 - FBS < 100 mg/dl (5.6 mmol/l) = normal fasting blood sugar
 - FBS 100–125 mg/dl (5.6-6.9 mmol/l) = IFG (impaired fasting glucose)
 - FBS ≥ 126 mg/dl (7.0 mmol/l) = provisional diagnosis of diabetes³
 - C. Serum lipid measurement in patients:-
 - Serum lipid profile was determined by “automated randox machine.”

Statistical Analysis

The effect of yoga practice on various parameters were recorded and statistically analyzed by paired *t*-test for evaluation. A *P* lower than 0.05 was considered significant.

RESULT

The effect of yoga on fasting blood sugar, lipid profile and blood pressure in smoker diabetic patient and non-smoker diabetic patients is shown in Table 1.

DISCUSSION

The science of Yoga is an ancient one. Several works has been done on the role of yoga in diabetes. In the present study, an attempt was made to evaluate the beneficial effects of Pranayama on Diabetic patients. Here we tried to assess the role of Pranayama on glycemic control and various co-morbidities such as hypertension and dyslipidemia. Known diabetic patients were taken. Patients with complications such as retinopathy, nephropathy were not included in the study, patients selected were explained the outline and aim of the studies and their consent taken. Those on treatment were advised to continue on the same drugs.

The result of this study suggests that no significant changes was observed in fasting blood glucose level and other blood lipid profile level including blood pressure in subjects who were addicted to those who were not. A study by Dr Vipin Mishra (cited by srivastava 2007)⁴ reported that; Yoga is a complementary therapy for patient with diabetes, although Yoga cannot take care of every aspect of the disease but regular practice of yoga does reduce blood sugar levels.

Sahay⁵ reported the useful role of yoga in the control of diabetes mellitus. Twenty-eight Type II diabetics and four Type I diabetics were studied for 1 month. They practiced four types of Pranayama for 30 min, followed by Shavasana for 15 min. Patients developed a sense of well-being within 7-10 days and showed a significant fall in fasting and post-prandial blood glucose values. For 4 in 17 patients the requirement of drugs came down significantly.

A study by Bijlani *et al.* (2005 cited Poole 2006),⁶ reported that there was a significant fall in fasting glucose level, however, total cholesterol, LDL cholesterol, VLDL cholesterol, total cholesterol/HDL ratio, and triglycerides, HDL cholesterol do not show significant change in diabetic patients after a 10 day integrated program of yoga (pranayama).

Mercuri *et al.*⁷ evaluated the clinical and metabolic changes, observed immediately and 3 months after daily Yoga practices in a group of people with Type II DM. Blood pressure (BP), heart rate (HR), and glycaemia also were recorded at the beginning and end of 13 alternate sessions. There were no overall significant differences (beginning vs. end of the study) in body mass index, HbA1, lipid profile, the dietary plan, habitual physical activity practice, BP, and treatment schedule. Conversely, there was a significant decrease in HR (8 sessions; *P* < 0.03) and glycaemia (10 sessions; *P* < 0.03) immediately after the Yoga sessions. The immediate positive effect of Yoga practices on glycaemia and HR suggests that such practices would be beneficial for the treatment of people with DM.

Badr *et al.*⁸ assessed the effect of practicing yoga for management of Type II Diabetes. The study results show improvement in outcomes among patients with Diabetes Type II. These improvements were mainly among short-term or immediate outcomes and not all were statistically significant. The results were inconclusive and not significant for the long-term outcomes. Further research is needed in this area. A definition recommendation for physicians to

Table 1: Effect of yoga on fasting blood sugar, lipid profile and blood pressure in smoker diabetic patient and non-smoker diabetic patients

n=28	Addicted diabetic patient (n=13)	Non-addicted diabetic patient (n=15)	t- value	P value and significance
FBS	152.826±21.543	152.623±27.602	t=0.024	P=0.88 Insignificant
Serum cholesterol	179.01±24.889	183.234±21.951	t=1.027	P=0.346 Insignificant
Serum HDL	44.445±5.272	45.354±6.357	t=-0.970	P=0.421 Insignificant
Serum LDL-C	121.549±13.260	112.391±12.362	t=1.903	P=0.069 Insignificant
Triglycerides	154.269±38.621	135.440±39.891	t=1.106	P=0.275 Insignificant
Serum cholesterol/HDL ratio	4.728±0.991	4.189±0.884	t=1.20	P=0.260 Insignificant
Systolic blood pressure	154.50±14.793	152.00±14.72	t=1.635	P=0.162 Insignificant
Diastolic blood pressure	93.89±6.34	93.223±5.62	t=1.099	P=0.277 Insignificant

HDL: High-density lipoprotein, LDL-C: Low-density lipoprotein-cholesterol, FBS: Fasting blood sugar

encourage their patients to practice yoga cannot be reached at present.

Since the present study was conducted taking all precautions to maintain standardization of yoga procedure and lab investigation for all these subjects. However, as planned in the study they were on their regular medication and dietary regime. No subject could achieve normal fasting blood sugar. It also appears that these subjects were happy about their blood sugar and other values achieved with medication regime they were following. They did not want to switch to insulin or go on a stricter diet-medication-exercise regime like so many diabetics all over world they want to avoid medicine and go for looking after some miraculous cure that according to them or general belief can help them cure their diabetes mellitus.

Yoga it appears does help them to lower their blood sugar level but in no way is helpful in achieving control of their diabetes mellitus. On the other hand, they seem to be learned into the belief that yoga is helping cure their diabetes and neglect or do not resort to more effective treatment regime by way of diet, medicine and regular aerobic exercises like brisk walk. These programs appear cumbersome to them.

CONCLUSION

We can infer from this study that the people need to know more about diabetes mellitus Type II and rationale of its management. They are to be made aware that alternative easy way outs are not helping them but as diabetes mellitus silently progress it compromises the function of many of the system so, they should not delay in achieving the effective control. Yoga can be an adjuvant, but not a replacement for tested and tried medical management of diabetes mellitus Type II.

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PEER REVIEW

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CONFLICTS OF INTEREST

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