

## TO STUDY THE EFFECT OF YOGA ON BLOOD SUGAR PROFILE IN DIABETICS TYPE-2 PATIENTS

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### Abstract

**Background:** Yoga is a Sanskrit word meaning union. It is Hindu spiritual and self-discipline method for integrating the body, breath and mind. It is a tradition of health and spirituality that evolved in the Indian peninsula over a period of some 5000 years

**Methods:** Prospective study was conducted on 100 type 2 diabetes mellitus patients and 100 normal healthy persons. Cases were recruited from a yoga centre. Control subjects were selected from diabetic patients attending hospital. Alcoholic or smoker subjects were excluded.

**Results:** The mean value of blood glucose level of subjects was  $7.42 \pm 1.32\%$  and that of controls was  $6.12 \pm 1.42\%$ . The difference between the mean value of HB1Ac level determined by unpaired 't' test was statistically highly significant ( $p < 0.001$ ).

**Conclusion:** Yoga can be used as an alternate therapy to reduce the blood glucose level along with the drug therapy.

**Keywords:** Yoga, Diabetics, Drugs.

### Introduction

Yoga is a Sanskrit word meaning union. It is Hindu spiritual and self-discipline method for integrating the body, breath and mind. It is a tradition of health and spirituality that evolved in the Indian peninsula over a period of some 5000 years.

History of yoga traditions starts with the yoga sutra written by Patanjali, a renowned yoga teacher and Hindu philosopher. Yoga has now entered the Western mainstream through the work of Swami Vivekananda, who popularized oriental Hindu philosophy in the late 19th and early 20th centuries.

Type 2 diabetes mellitus (T2DM) is a common metabolic disorder characterized by chronic hyperglycemia. It is a leading cause of morbidity and mortality worldwide, associated with severe complications such as cardiovascular disease, cerebrovascular disease, or chronic renal disease. It is projected to be the 7th leading cause of death by 2030.<sup>1</sup>

Conventional anti-diabetic medication therapy includes oral administration of hypoglycemic agents and insulin therapy. These methods have been shown to be beneficial in the initial phase of T2DM; over a period of time, however, a significant number of patient reports indicate a reduced efficacy of most anti-diabetic medications. Further, these medications are associated with several

adverse effects including weight gain, weakness, fatigue, lactic acidosis, or diarrhea, and they may increase LDL cholesterol level. Vigorous insulin treatment may also carry an increased risk of atherogenesis<sup>2</sup>

Several scientific investigations have shown the health-benefiting effects of yoga in various chronic health conditions including T2DM1, neuromuscular diseases, psychiatric illnesses, asthma, hypertension, and coronary artery disease.<sup>3-4</sup>

### Materials and Methods:

Type of study- Prospective study

Sample size- 100 type 2 diabetes mellitus patients and 100 Control subjects

Cases were recruited from a yoga centre.

Control subjects were selected from diabetic patients attending hospital.

Inclusion criteria- Total subjects were grouped into 100 type-2 diabetes mellitus case for yoga practitioners and 100 type-2 diabetes mellitus case for non yoga practitioners.

Exclusion criteria- Alcoholic or smoker person

The eligibility criterion for controls was same as that of subjects but they were not yoga practitioners and did not believe in yoga. The diabetics had complete drug

compliance throughout the study period. The experimental subjects were taking 1½ hour session for at least four times a week at a yoga centre. None of the subject engaged in any other out-of-routine physical activity.

The blood sampling was done between 9.00 am to 10.00 am from a forearm vein of all the participants with fasting for more than eight hours.

Data analysis- Student's T-test and Chi-square test were applied. Results were presented as mean  $\pm$  SD or no. of patients (percent); P value <0.05 defined statistical significant difference.

### Results:

**Table 1:** Socio-demographic variable

Socio-demographic variable	Case	Control	p-value
Age (Years)	51.23 $\pm$ 9.11	52.32 $\pm$ 9.16	>0.05
Male : Female	44:6	43:7	>0.05

Socio-demographic variable in both group were comparable.

**Table 2:** Shows the mean blood sugar levels in and controls.

Fasting blood sugar level	Case	Control
Mean	137.5	92.36
SD	10.23	9.18
p-value	<0.001	

The mean value of blood glucose level of subjects was 137.5 $\pm$ 10.23 mg/dl and that of controls was 92.36 $\pm$ 9.18 mg/dl. The difference between the mean value of fasting blood glucose level determined by unpaired 't' test was statistically highly significant (p=<0001).

**Table 3:** Shows the mean HB1Ac levels in and controls.

HB1Ac level	Case	Control
Mean	7.42	6.12
SD	1.32	1.42
p-value	<0.001	

The mean value of blood glucose level of subjects was 7.42 $\pm$ 1.32% and that of controls was 6.12 $\pm$ 1.42%. The difference between the mean value of HB1Ac level determined by unpaired't' test was statistically highly significant (p=<0001).

### Discussion

In the present study, the mean value of fasting blood glucose was less than that of controls and the difference between the two was statistically highly significant. Our observations were in compliance with the study conducted by Cerranque et al,<sup>5</sup> in 26 subjects. The experimental group consisted of 16 long-term yoga practitioners and 10 healthy ordinary subjects. The results revealed a decrease in the blood glucose level in yoga practitioners, as compared to controls.

Our findings are also in compliance with the study conducted by Hegde et al.<sup>6</sup> on the effect of three month yoga practice on oxidative stress in type-2 diabetics. Yoga practitioners achieved significant improvement in body mass index, fasting blood glucose level, postprandial blood glucose, glycosylated haemoglobin, glutathione and vitamin-C at 3 months compared with the standard care group. Gordon et al.<sup>7</sup> also reported 20% reduction in oxidative stress and decrease in blood glucose level.

### Conclusion

Yoga can be used as an alternate therapy to reduce the blood glucose level along with the drug therapy.

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