

## Effect of Yoga on Glycosylated hemoglobin levels in Diabetic subjects

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### Abstract

**Background and Objectives:** Yoga is a popular therapy for type 2 Diabetes Mellitus. India is considered the capital of Diabetes in the universe, as 1 in every 11 deaths is due to Diabetes mellitus. The World Health Organization has announced “BEAT DIABETES” as the goal of 2016. This study is done to assess the role of Yoga as a healer of Diabetes Mellitus, specifically type 2 Diabetes Mellitus. **Aims and Objectives:** To compare the glycosylated hemoglobin levels in the Diabetic subjects who are practicing and not practicing Yoga.

**Materials and Method:** The study and control group includes 100 male diabetic individuals between 50-65 years, 50 members practicing Yoga regularly and 50 members not practicing yoga. Glycosylated hemoglobin compared between the study and control group.

**Results:** There is significant reduction in the glycosylated hemoglobin levels in diabetic individuals practicing yoga.

**Conclusion:** yoga can be practiced by diabetics as a measure of reducing the mortality due to diabetes.

**Keywords:** Diabetes mellitus, Yoga, Glycosylated hemoglobin.

### Introduction

The science of yoga is an ancient art as far as India is concerned. It is a rich heritage of Indian culture. Yoga is not merely asana i.e. change in postures, but a holistic approach towards a healthy life. Yogic lifestyle includes physical, mental, emotional, social and spiritual well-being. As far as diabetes mellitus is concerned, it has become the responsibility of each and every Indian to update the knowledge regarding diabetes mellitus, since every 1 in 11 deaths is due to diabetes and its complications. It's really an indigestible truth to believe that India is now considered as the capital of diabetes in the universe. This has driven the World Health Organization to have its motto for this year 2016 as “Beat Diabetes”. The above said factors lead to do this study in Govt. Theni medical college to assess the role of Yoga in controlling the blood sugar levels in diabetic subjects and also to know effect of yoga on glycosylated hemoglobin levels which reveals the blood sugar control for the past 6months to 1 year. It's a well known fact that as per the reference Sahay. B.K. Yoga and diabetes Association of Physicians India 1986:34:645-48. Yoga has its influence on type 2 diabetes mellitus which is mainly due to insulin resistance and exhaustion, but not complete depletion of insulin as in type 1 diabetes mellitus. The main objective of this study is to emphasize the importance of practicing yoga in controlling the blood sugar levels and also in preventing the various complications of diabetes like neuropathy, nephropathy, retinopathy etc. in type 2 diabetic individuals.

### Methods and Material

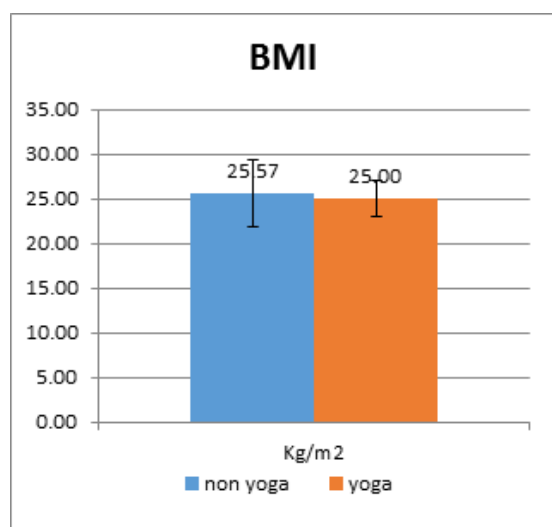
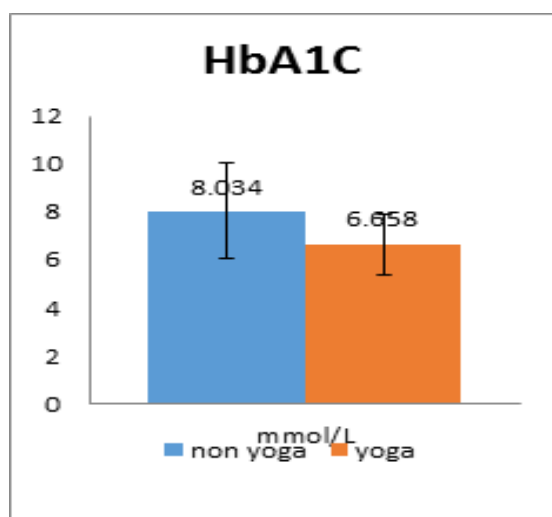
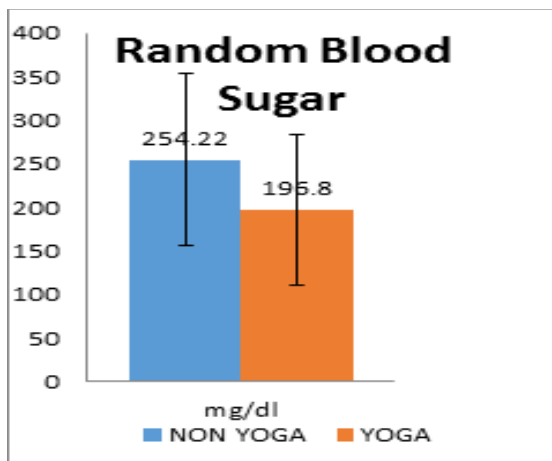
The study group consists of 50 male subjects suffering from Type 2 diabetes mellitus of varying duration in the age group of 45-65 years, who are

practicing Yoga for 6 months and above along with anti- diabetic treatment. The control group consists of 50 male subjects suffering from type 2 diabetes mellitus in the same age group on antidiabetic treatment, but not practicing yoga. Diabetic subjects practicing yoga were chosen from Theni Arivu Thirukoil, which is a centre for “vaazhha vazhamudan” yoga practice. Diabetic subjects not practicing yoga were randomly chosen from the diabetic outpatient department in Govt. Theni Medical college hospital. Hypertension, ischemic heart disease, thyroid disorders, and the complications of diabetes mellitus were excluded in both the groups. The details of the treatment followed by the diabetic subjects in both the groups were recorded. Height, weight, BMI, pulse and blood pressure were recorded for all the individuals. Blood samples were taken for estimation of random blood sugar and glycosylated hemoglobin levels. Random blood sugar was estimated by fully automatic analyzer method. Glycosylated hemoglobin estimation was done by Quantia turbidimetric immunoassay for determination of HbA1c method.

### Results

**Table 1**

Parameters	Control	Yoga Group
RBS in mg/dl	254.22±28.07	196.8±24.63
HBA1Cmmol/L	8.03±0.56	6.65±0.35
BMI kg/m <sup>2</sup>	25.56±1.05	24.99±0.57
Data are means±SD. p values are significant in Yoga group compared with controls for RBS&HBA1C		



### Discussion

Results of the present study reveals that there is a significant difference in the HbA1c levels compared between the type 2 diabetic subjects of those who practice yoga and those who did not practice yoga. This result is consistent with the results of the study

conducted by Shreelakshmi. V. Hegde. PHD. Veena. J. Pinto. MD. Where the mean % reduction in HbA1c is 1.4% (-0.1+/-0.2%) in study subjects as compared with controls where it was 6.25% (0.5& +/- 0.3%). The possible mechanisms of how yoga contributes in the reduction of HbA1c levels is by effectively reducing the stress levels thus reducing the glucagon action (whose secretion is increased by stress), thereby improving insulin action. By reducing the stress, yoga reduces the levels of adrenaline noradrenalin and cortisol too which is a likely mechanism of enhanced insulin action as proved by the study done by Dr. Sujit Chandratreya, MD DM DNB Endocrinologist & Diabetologist. Yoga practice causes muscle relaxation and also the development and increased blood supply of the muscle which will increase the insulin receptor expression of the muscles causing increased glucose uptake by the muscles and thus reducing the blood glucose levels. Doing yoga regularly, increases the working capacity of the muscles and also the exercise tolerance, which ultimately results in decreased body fat and increased muscle mass, a contributing factor for getting the blood glucose levels under control. Another possible mechanism by which yoga contributes for decreased blood sugar level is, many postures do produce stretch on the pancreas which is likely to stimulate the function of pancreas.

### Conclusion

From the present study, it is clearly evident that practicing yoga do have a positive influence in controlling the blood glucose levels in diabetic individuals. The random blood sugar levels are almost equal in both the groups whereas there is a significant decrease in the HbA1c levels in type 2 diabetic subjects practicing yoga compared with non-yogic individuals. Moreover as per the article published in Journal of Association of Physicians of India 55,125-126 by Sahay. B.K. (2007) it was concluded that by performing yoga regularly, 305 of the people with type 2 diabetes can control their diabetes without any medicines and in remaining 70% the dose of medicines can be decreased by 20 to 40%. Above all one cannot imagine the benefits of yoga without practicing it. Let us promote the practice of yoga by spreading the essence of benefits in regular yoga practice and curtail further progression and complication of type 2 diabetes mellitus.

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Yoga Practitioners of Theni Arivu Thirukoil a Centre of excellence- "Vaazhha Vazhamudan".

Diabetic patients of Govt. Theni medical college hospital, Theni.

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