

## Effect of Three Months Yoga Treatment on Diabetes Mellitus Patients

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### Abstract

The study was conducted to determine the effect of three months yoga treatment on diabetes mellitus patients. For the purpose of the study 30 middle aged (age range 40-45 yrs) diabetic mellitus patients were purposely selected from Ojas Nature Cure Centre, NKS Hospital, Gulabi Bagh, Delhi. The selected patients underwent three months of yoga treatment. Glycated Hemoglobin (HbA1C), Fasting Blood Glucose Level (FBS), Post Prandial Glucose Level (PBS), High Density Lipoproteins Cholesterol (HDL) and Low Density Lipoproteins Cholesterol (LDL) were measured through blood test. The blood tests were administered before and after the three months of yoga treatment. The findings of the study revealed a significant improvement among the diabetes mellitus patients as the Glycated Hemoglobin (HbA1C) was improved by 23.28%, Fasting Blood Glucose Level (FBS) was improved by 48.89%, Post Prandial Glucose Level (PBS) was improved by 59.91%, High Density Lipoproteins Cholesterol (HDL) was improved by 32.34% and Low Density Lipoproteins Cholesterol (LDL) was improved by 19.23%. These improvements in the selected variables were found significant as the paired 't' values obtained were 37.07, 66.36, 96.83, 8.42 and 19.74 at  $p \leq 0.05$ . It is concluded that yoga can be used as one of the treatment methods to reduce diabetes mellitus among the middle aged men.

**KEYWORDS:** Glycated Hemoglobin, Fasting Blood Glucose, Post Prandial Glucose, High Density Lipoproteins Cholesterol and Low Density Lipoproteins Cholesterol.

### Introduction

Diabetes is often called the silent killer because people who have it are often unaware they are affected. The normal level of blood sugar in a fasting person is between 80-120mg percent. If the fasting level of blood sugar is more than 110mg percent or after meals more than 160mg percent, it is called high blood sugar (Diabetes Mellitus). In diabetic patients, sugar can be detected in the urine also. Patients with diabetes have a higher chance of development of coronary blockages. They also get several other diseases like kidney damages as well as damage to the nerves and eyes (**Imayama, 2011**).

Diabetes mellitus is the most common metabolic disorder affecting humankind. Though the disease is known from ancient times, and several breakthroughs have been made, including the discovery of Insulin in 1921, neither the etiology is clearly understood nor has the cure been found. Modern medicines manage to control hyperglycemia, which is the hallmark of the disease and thereby provides relief from symptoms and prevents or delays the complication. But modern medicines are most

costly and diabetes mellitus is burdensome chronic disease of our time and a condition that is increasing in epidemic proportion worldwide (**Bamji, 2004**).

World Health Organization study group on Diabetes Mellitus has recognized two types of diabetes namely Insulin Dependent Diabetes Mellitus (IDDM) and Non Insulin Dependent Diabetes Mellitus (NIDDM). In the recent past, the term Insulin dependent diabetes mellitus (IDDM) has been replaced by Type I diabetic. Type I diabetic patients have  $\beta$  cell destruction, which is usually immune mediated the majority of the patient develop absolute insulin deficiency and are ketosis prone. The term non insulin dependent diabetes mellitus (NIDDM) has been replaced by Type II diabetic, which encompasses the most prevalent form of disease. Most patients with type II diabetes 2 mellitus exhibit insulin resistance (IR) and ultimately develop concomitant insulin secretary defect (**Shaw, 1998**).

Insulin resistance is a multifaceted syndrome responsible for the future development of type 2 diabetes, obesity, hypertension, dyslipidemia and atherosclerotic cardiovascular diseases. Insulin resistance present in patients with impaired glucose tolerance and hyperinsulinemia are the two major biochemical manifestations. The factors that contribute to insulin resistance are age, high fat diet, decreased physical activity, increased visceral fat accumulation, smoking and hyperglycemia (**Nesto, 2003**).

The world is experiencing 30% increase in mortality due to non-communicable diseases (NCD), from 2, 65, 60, 300 deaths in 2000 to 3, 45, 39, 000 in 2014. Diabetes Mellitus (DM) is the biggest disorder in this group for Global Burden of Disease (GBD) 2010, which has taken a heavy toll of 12, 81,300 deaths in 2014, 92.7% to rise over 6, 65,000 deaths in 1990. Systemic complications of DM have also shown steep rise like Chronic Kidney Disease (CKD) has caused 91,900 mortality in 1990 as compared to 1, 78,300 in 2014 with 94.1% rise in a span of decade.

There are several hypotheses for the biological mechanisms that link the benefits of yoga and naturopathy to diabetes management. One hypothesis points at the role of stress and relaxation, while others suggest endocrinal modulation and improvements in oxidative stress through neuro-endocrinal mechanism. These hypotheses, however, have a limited generalizability as the studies have small sample sizes, different types of outcome and methodological issues. These limitations should be taken into consideration before evidence based conclusions can be drawn. There is a clear need to study efficacy of alternative therapies like yoga and naturopathy because of its holistic nature, cost effectiveness, self-administered and free of side effects. The American Diabetes Association (ADA) Position Statement recommends that the use of adjuvant therapies be based on evidence from clinical research. Many previous experimental studies which have reported beneficial effects of yoga and naturopathy in Type IIDM are limited by several issues like unclear methodology, interventions and program structure, Quasi experimental, lack of control group, confounding variables and smaller sample sizes. Some studies have even presented few data or too many confounders which make study difficult to generalize; hence the present study was undertaken.

## Objectives and Hypothesis

The study was conducted to determine the effect of three months yoga treatment on diabetes mellitus middle aged patients. After thoroughly going through the literature it was hypothesized that there would be no significant effect of Yoga Training on the selected variables of diabetes mellitus middle aged patients.

## Methodology

A total of thirty diabetes mellitus type II middle aged patients were purposively selected from the list of patients visited Ojas Nature Cure Center, NKS Hospital, Gulabi Bagh, Delhi for the treatment of diabetes mellitus type II through Yoga under the experts of Ojas Nature Cure Center. The selected patients were in the age range from 40-45 years. The selected patients underwent three months yoga training in the Ojas Nature Cure Center, NKS Hospital, Gulabi Bagh, Delhi. Glycated Hemoglobin (HbA1C), Fasting Blood Glucose Level (FBS), Post Prandial Glucose Level (PBS), High Density Lipoproteins Cholesterol (HDL) and Low Density Lipoproteins Cholesterol (LDL) were used to measure condition of the diabetes mellitus patient. The results obtained from the blood test on the selected variables were quantified and further paired 't' test was employed to measure the significance in the effect of the yoga treatment on diabetes mellitus middle aged patients.

**Training Protocol:** The training was executed by the scholar himself in the evening from 4:00 PM onwards for 1 to 1.5 hours for three days in a week at Ojas Nature Cure Center, Delhi, i.e. Friday, Saturday and Sunday. The training was continued for three months. The Yoga Training program was as follows:

Asana & Pranayama	First 6 Weeks	6-12 Weeks
Suryanamaskar	(5 sec hold)- 2 Times	(5 sec hold)- 3 Times
Tadasana	(5 sec hold)- 2 Times	(5 sec hold)- 4 Times
Trikonasana	(8 sec hold)- 2 times	(10 sec hold)- 4 times
Vajrasana	(5 sec hold)- 2 Times	(8 sec hold)- 4 Times
Padmasana	(10 sec hold)- 4 Times	(10 sec)- 6 Times
Ardhamatsyendrasana	(10 sec hold)- 2 Times	(10 sec hold)- 4 Times
Paschimotasana	(5 sec hold)- 2 Times	(5 sec hold)- 4 Times
Bhujangasana	(5 sec hold)- 2 Times	(5 sec hold)- 4 Times
Dhanurasana	(5 sec hold)- 2 Times	(5 sec hold)- 4 Times
Naukasana	(5 sec hold)- 2 Times	(5 sec hold)- 4 Times
Shavasana	(20 sec hold)- 6 Times	(30 sec hold)- 8 Times
Kapal-bhati	2 times	4 times
Anulom-vilom	4 times	6 times
Bhramari	2 times	4 times

## Analysis of the Data and Findings

**Table – I: Effect of Three Months Yoga Treatment on Diabetes Mellitus Patients**

S No	Variables	Pre Test	Post Test	Improvement	't'
1	<b>Glycated Hemoglobin (HbA1C)</b>	8.16± 0.63	6.26± 0.75	23.28%	37.07*
2	<b>Fasting Blood Glucose Level (FBS)</b>	243.55± 10.88	124.48± 7.99	48.89%	66.36*
3	<b>Post Prandial Glucose Level (PBS)</b>	342.81± 7.94	137.42± 12.33	59.91%	96.83*
4	<b>High Density Lipoproteins Cholesterol (HDL)</b>	37.29± 4.78	49.35± 8.10	32.34%	8.42*
5	<b>Low Density Lipoproteins Cholesterol (LDL)</b>	125.45± 11.32	101.32± 12.42	19.23%	19.74*

N- 30, \*\*Significant at 0.05 level

Table- I clearly reveals that the Glycated Hemoglobin (HbA1C) had lowered down by 23.28% as the Glycated Hemoglobin (HbA1C) before and after the yoga treatment were found as 8.16± 0.63 and 6.26± 0.75. This decrease in the level of HbA1C was found significant as the 't' values obtained was 37.07 at  $p \leq 0.05$ . The Fasting Blood Glucose Level (FBS) had lowered down by 48.89% as the Fasting Blood Glucose Level (FBS) before and after the yoga treatment were found as 243.55± 10.88 and 124.48± 7.99. This decrease in the level of FBS was found significant as the 't' values obtained was 66.36 at  $p \leq 0.05$ . The Post Prandial Glucose Level (PBS) had lowered down by 59.91% as the Post Prandial Glucose Level (PBS) before and after the yoga treatment were found as 342.81± 7.94 and 137.42± 12.33. This decrease in the level of PBS was found significant as the 't' values obtained was 96.83 at  $p \leq 0.05$ . The High Density Lipoproteins Cholesterol (HDL) had improved by 32.34% as the High Density Lipoproteins Cholesterol (HDL) before and after the yoga treatment were found as 37.29± 4.78 and 49.35± 8.10. This increase in the level of HDL was found significant as the 't' values obtained was 8.42 at  $p \leq 0.05$  and the Low Density Lipoproteins Cholesterol (LDL) had lowered down by 19.74% as the Low Density Lipoproteins Cholesterol (LDL) before and after the yoga treatment were found as 125.45± 11.32 and 101.32± 12.42. This decrease in the level of LDL was found significant as the 't' values obtained was 19.74 at  $p \leq 0.05$ .

## Discussion and Conclusions

The findings of the study revealed a significant improvement among the diabetes mellitus patients as the Glycated Hemoglobin (HbA1C) was improved by 23.28%, Fasting Blood Glucose Level (FBS) was improved by 48.89%, Post Prandial Glucose Level (PBS) was improved by 59.91%, High Density Lipoproteins Cholesterol (HDL) was improved by 32.34% and Low Density Lipoproteins Cholesterol (LDL) was improved by 19.23%. The Results are supported from a study, which shows that there are lots of chemical agents available to control and to treat diabetic patients, but total

recovery from diabetes has not been reported up to this date. In addition to adverse effects, drug treatments are not always satisfactory in maintaining euglycemia and avoiding late stage diabetic complications. Alternative to these synthetic agents, plants provided a potential source of hypoglycemic drugs and are widely used in several traditional systems of medicine to prevent diabetes. Several medicinal plants have been investigated for their beneficial effect in different type of diabetes, other alternative therapies such as dietary supplements, acupuncture, hydrotherapy, and yoga therapies less likely to have the side effects of conventional approaches for diabetes(Avwanish Pandey, 2011).

## Reference

- Acharya, B. (2010). Effect of Pranayama (voluntary regulated breathing) and Yogasana (yoga postures) on lipid profile in normal healthy junior footballers. *International Journal of Yoga*, 3 (2), 70.
- Alan, M. (1987). Stress and Coping in Relation to Metabolic Control of Adolescents with Type 1 Diabetes. *Journal of Developmental and Behavioral Pediatrics*, 8 (3), 423-428.
- Amita, S. (2009). Effect of yoga-nidra on blood glucose level in diabetic patients. *Indian Journal of Physiology and Pharmacology*, 53 (1), 97-101.
- Awasthy, S. (2013). Effective management of type 2 DM in India: looking at low-cost adjunctive therapy. *Indian Journal of Endocrinological Metabolism*, 17 (1), 149-152.
- Aynalem, S. B. (2018). Prevalence of Diabetes Mellitus and Its Risk Factors among Individuals Aged 15 Years and Above in Mizan-Aman Town, Southwest Ethiopia, 2016: A Cross Sectional Study. *International Journal of Endocrinology*, 2 (1), 7.
- Beever, R. (2010). The Effects of Repeated Thermal Therapy on Quality of Life in Patients With Type II Diabetes Mellitus. *Alternative Complementary Medicine*, 16 (6), 677-681.
- Benninger, R. (2018). New Understanding of  $\beta$ -Cell Heterogeneity and In Situ Islet Function. *Diabetes*, 67 (4), 537-547.
- Chhajer, B. (2005). *Tips for Diabetes Patients*. New Delhi, India: Fusion Books.
- Chimkode, S. M. (2015). Effect of Yoga on Blood Glucose Levels in Patients with Type 2 Diabetes Mellitus. *Research Journal of Clinical Diagnosis*, 9 (4), 01-03.
- Cui, J. (2017 ). Effects of yoga in adults with type 2 diabetes mellitus: A meta-analysis. *Journal of Diabetes Investigation*, 8 (2), 222-227.
- Darey, K. (1983). *Yoga and your heart*. Mumbai, India: Jaico Publishing.
- Dash, S. (2014). Effect of yoga in patient's with type-II diabetes mellitus. *Journal of Evolution of Medical and Dental Sciences*, 3 (7), 1642-1655.

- Gordan, A. (2019). Use of Ayurveda in the Treatment of Type 2 Diabetes Mellitus. *Global Advance Health Medicine*, 8 (2), 112-115.
- Harshitha, S. (2018). Comparative study of bitter gourd juice, ash gourd juice and knolkhol juice on blood glucose level among type ii diabetes mellitus – a pilot study. *EJBPS*, 5 (7), 400-404.
- Innes, K. E. (2016). Yoga for Adults with Type 2 Diabetes: A Systematic Review of Controlled Trials. *Journal of Diabetic Research*, 12 (2), 23.
- Iyenger, B. (2001). *Yoga – The path of Holistic Health*. Great Britin: Dorling Kindersiley Limited.
- Jali, M. V. (2017). The influence of yoga therapy in adults with type 2 diabetes mellitus: A single-center . *Yoga Mimamsa*, 49 (1), 9-12.
- Kahn, A. (1963). *Diabetes, Causes, Prevention and Treatment*. New Delhi, India: Orient Paper Books.
- Kudigra, S. (2018). Effect of Yoga Theraphy on Fasting Blood Sugar and to Study the distribution of Anthropometric measures in Diabets - 2 Patients. *Internationa Journal of Complementary & Alternative Medicine*, 11 (1), 127-133.
- Lawrence, E. (1976). *Physiology of Exercise* (5 ed.). Saint Louis: The CV Mosby Company.
- Mandal, A. (2014). Study of Prevalence of Type 2 Diabetes Mellitus and Hypertension in Overweight and Obese People. *Journal of Family Medicine and Primary Care*, 3 (1), 25-28.
- Melkote, G. (1975). *Science of Yoga versus modern medicine in Seminars on Yoga*. New Delhi, India: MHE.
- Newberg, A. (2003). The neural basis of the complex mental task of meditation: neurotransmitter and neurochemical considerations. *Medical Hypotheses*, 61 (3), 282-291.
- Olokoba, A. B. (2012). Type 2 Diabetes Mellitus: A Review of Current Trends. *Oman Medical Journal*, 27 (4), 269-273.
- Prasad, K. (2006). Impact of Pranayama and Yoga on Lipid profile in normal healthy volunteers. *Journal of Exercise Physiology Online*, 9 (1), 72-78.
- Ramamoorthi, R. (2019). The effect of yoga practice on glycemic control and other health parameters in the prediabetic state: A systematic review and meta-analysis. *Online Journal*, 3 (2).
- Rashmi, S. (2016). Herbs and Botanical Ingredients with Beneficial Effects on Blood Sugar Levels in Pre-diabetes. *Herbal Medicine*, 2 (1), 139-142.
- Sethi, A. (2006). *Diabetes Control*. New Delhi, India: Pustak Mahal.
- Sharma, M. (2012). Role of Yoga in Preventing and Controlling Type 2 Diabetes Mellitus . *Journal of Evidence based Complementary and Alternative Medicine*, 17 (2), 88-95.