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IMPACT ON YOGA THERAPY EFFECTS ON CARDIO METABOLIC HEALTH IN PEOPLE WITH TYPE 2 DIABETES MELLITUS

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ABSTRACT

Background: Diabetes is a multiorgan-targeting metabolic disorder most prevalent in the Indian population that significantly affects the quality of life. Individuals who practice yoga can have the beneficial effect of maintaining good health. Additionally, it has a positive effect in controlling blood sugar levels. The purpose of this study is to compare the effects of yoga on cardio metabolic health in Type 2 diabetes mellitus.

Materials and Methods: A total of 100 participants were included in the study, and 50 participants were under yoga intervention with medication, and the other 50 were only under medication and considered as the control group. It is a randomized controlled study conducted for three months in Chennai City to evaluate the effect of yoga.

Results: There were significant variations in FBS and HbA1C comparing pre- and post-test values of 132.35±24.84 and 7.82±0.85, respectively. While the systolic and diastolic blood pressure did not have any changes even after yoga interventions. The body mass index was considerably lower with a value of 23.43±2.32 than those of the control group.

Conclusion: Research suggests that practicing yoga may aid in preventing and managing diabetes, proposing it could be an effective auxiliary method to Type 2 diabetes mellitus.

Key Words: Blood Pressure, fasting blood sugar, Diabetes, Yoga, Glycated haemoglobin

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INTRODUCTION

India is stated to as the leading harbour for diabetes cases globally. The number of people living with diabetes rose from 200 million in 1990 to 830 million in 2021 worldwide due to the trending modern life style and in India it is expected to reach 125 mollion by 2045 [1,2]. There is a decline in physical activity, and excess food intake is supplying calories that are high in fat that plays an important role in the rising incidence of diabetes in India. Nevertheless, it is anticipated that the incidence of diabetes would keep rising worldwide without efficient prevention or control measures. The pathogenesis of Type 2 Diabetes Mellitus (T2DM) is not fully understood, Dyslipidemia, hyperglycemia with or without other metabolic disorders had resulted in T2DM. The continuous hyperglycemic condition can target various organ and thus increasing metabolic disorders like obesity and cardiovascular-kidney-metabolic syndrome. [3]

Yoga science is an old science practiced as a physical exercise to stay healthy and frequently used in variety of mental and physical health ailments. Many individuals report practicing yoga to improve their mental health, reduce stress, or bolster their mood [4]. Nowadays, there is a greater emphasis on preventing Type 2 diabetes and its consequences by maintaining a healthy diet, doing exercise, and getting enough sleep. Yoga is a useful approach that combines numerous methods intended to at fostering a condition of health and wellbeing. The purpose of these poses is to increase the flexibility and stability of the spine and to improve blood flow to all tissues, glands, and organs maintaining the health of every bodily system. Yoga techniques have the potential to reduce blood pressure and pulse rate, facilitate breathing, and enhance heart rate variability, all of which are positive indicators of good health and improved parasympathetic tone [5].The present study was planned to evaluate the positive effect of yoga practices in controlling the blood glucose and other indicators with special emphasis on HbA1C (Glycated haemoglobin) in T2DM.

MATERIALS AND METHODS

The current investigation was a randomized controlled experiment. There were fifty individuals in the research group and fifty individuals in the group under control. The objective of this research was conducted to examine the impact of yoga practice on participants with T2DM after three months.

Work strategies

A total of 100 T2DM individuals were involved in this study out of which 50 were in Experimental group and rest 50 were included in the control group. The institutional ethical committee has authorized this investigation. The Experimental group were individuals who strictly practice yoga along with medication. While the control group involved individuals who only took medication and no other extra measures. The candidates were selected based on the exclusion and inclusion criteria.

Criteria for Inclusion

The study's inclusion criteria included the following Individuals who had Type 2 diabetes at the time of the research, Individuals who are 30 to 50 years old and Individuals using hypo-glycemic oral medicines.

Criteria for Exclusion

The Exclusion criteria were as follows Younger than thirty or older than fifty years , Patients, athletes, and regular yoga practitioners engaging in a different kind of exercise, Expectant mothers, Past history of drinking alcohol, smoking, and chewing tobacco, A history of chronic obstructive airway disease and TB illness, as well as respiratory infections during the previous six weeks.

Analytical Biochemistry

The fundamental standards applied in biochemical research include serum sample collection, glycemic parameters, and blood collection.

Analytical Statistics

Analysis of results were Statistical performed using SPSS 18. The unpaired t-test was used to find differences between the two courses. P-values are defined and assessed using a paired t-test using both before and after modifications in the two groups (control and study). $P<0.001$ was deemed statistically significant. $P<0.05$ is significant, while $P>0.05$ is not significant.

RESULTS

The diabetes is a growing health concern in recent years due to the modified lifestyle in this busy world. In this study a total of 100 participants were included and out which 50 were selected as control group and 50 were used as control group based on random sampling technique. Study group or the experimental group included individuals subjected to yoga treatment along with medication while the control group were individuals who followed the medication alone. The period of this study was for three months and the significant criteria included in this study were weight, height, and BMI, Blood Pressure**,** FBS and HBA1c. The (Table 1) shows the distribution of Weight, Height and BMI of both study and control group before and after 3 months of treatment. Out of the three major variables analysed weight and BMI showed great significance with a pre and post-test value of 65.72±12.45 & 63.71±12.03, 24.27±2.41&23.43±2.32 respectively in the study group and rest of the data's can be visualized in the Table 1 .

Table 1: Distribution of weight, height, and BMI between before and after yoga among study group and control group

Variables	No	Mean /Std. deviation		P Value
(study Group)		**Pre-Test**	**Post-Test**	
Weight (kg)	50	65.72±12.45	63.71±12.03	<0.0001*
Height(cm)	50	163.5±8.60	163.5±8.61	1.000
BMI	50	24.27±2.41	23.43±2.32	<0.0001*
Control group				
Weight(kg)	50	68.93±8.53	68.92±8.56	1.000
Height (cm)	50	160.37±8.56	160.36±8.57	1.000
BMI	50	26.25±4.32	26.25±4.31	1.000

In (Table 2) the blood pressure variation in both control and study group before and after treatment was analyzed and it was interesting that there was a marginal variation in the systolic blood pressure level pre and post - test in the study group and no variation was observed in the control group rest of the details are given in the Table 2. The comparison of two important criteria namely the FBS and HbA1c was recorded for both study and control group before and after three months. In this current investigation, it was found that the mean value of fasting glucose and HbA1C levels were considerably lower in the study group compared to the control group thought both results were statically significant [Table 3].

Table 2 Distribution of BP between before and after 3 months among study group and control group

Variables	Mean / Std. deviation		P Value
(Study Group)	**Pre-Test**	**Post-Test**	
Systolic BP	120.43±1.51	119.72±2.23	0.01*
Diastolic BP	72.05±3.42	72.08±3.41	0.91
Control Group			
Systolic BP	119.83±1.95	119.47±2.32	0.24
Diastolic BP	73.02±2.42	73.56±2.96	0.32

Table 3 Distribution of FBS and HbA1C between before and after 3 months among study group and control group

Variables	Mean / Std. deviation		P-value
(Study group)	**Pre-Test**	**Post-Test**	
FBS	149.13±27.56	132.35±24.84	<0.0001*
HBA1C	8.03±0.90	7.06±0.85	<0.0001*
(Control group)			
FBS	152.9±27.47	148.3±28.40	<0.0001*
HBA1C	8.54±0.90	8.07±0.92	<0.0001*

DISCUSSION

In genetically predisposed individuals, environmental variables, psychosocial factors and stress play a significant role in the development of type 2 diabetes. The possibility of stroke and cardiovascular disease are significantly more common in type 2 diabetes [6]. Cohen and associates stated that "enrolled patients' systolic and diastolic blood pressure and completion rates dropped dramatically in every group at Weeks 12 and 24 [7]. Several medications that treat diabetes are focusing on the regulation of blood sugar levels. Nevertheless, after extended use it causes severe side effects like tolerance to drugs, heart failure, risk of bladder cancer etc [8, 9]. Therefore, this have attracted many researchers to work on Diabetes in recent years to find an alternative remedies that might both control and prevent the complications associated with DM. It was interesting to note that from several published finding that yoga could reduce levels of blood sugar and manage diabetes effectively. Yoga helps to treat diabetes mellitus by releasing insulin from the pancreas, as demonstrated by Manjunatha et al. Following five days of doing four sets of asanas in a random order, their results showed that asana success resulted in higher pancreatic B cell sensitivity to the glucose signal [10].

According to research by Malhotra et al., the precise mechanism of synchronized breathing and yoga poses with the process of kinetics of somato endocrine insulin. Their results indicated that elevations of blood insulin levels and serum insulin level raises were considerably reduced along with the waist-hip ratio. They showed that yoga posture had a positive impact on glucose level and non-insulin-dependent diabetes mellitus fat [11]. According to Gordon et al., "The benefits of yoga on blood glucose levels are consistent with the findings of our current research, and it is believed that yoga initiates the pancreatic gland to relax the muscles. Yoga activities promote relaxation, deep inhalation, bending and spinal twists and turns, help the pancreas to induce pancreatic beta cells [12]. Amita et al. conducted a study on the effect of yoga nidra on blood glucose levels among 41 middle-aged individuals with type 2 diabetes and his findings supported the fact that patients who practiced yoga nidra along with medication had more control over blood sugar levels compared to the medication regimen alone and this study correlated with the present study. [13]. Sahay stated in a report that there was a "notable decrease in postprandial blood glucose and fasting glucose in T2DM with yoga practice. The positive outcome is a result is believed to be due to the increased insulin sensitivity in T2DM yoga at the intended areas, decreasing insulin resistance and enhancing the peripheral utilization of glucose [14].

From an observation by Singh et al. [15] it was observed that practicing yoga can increase the sensitivity of the pancreatic B cells to the glucose signal. The significance of the research lies in its attempts to examine the process by which yoga lowers blood sugar for the initial instance. Significant reduction in FBG levels correlates with the current study, where there was a significant drop in FBG levels in people who practiced yoga for three months. The precise reason behind the decline in HbA1c is unknown; however, the decrease in HbA1c shields patients from the early onset of microvascular complications of macrovascular diabetes. The Bijlani et al. [16] reported that happier and more comfortable senses of overall well-being as well are a sense of relief from anxiety, similar effect was observed in the current study too. The altered stance and synchronized breathing in pranayama and grown observant and dynamic is linked to yoga; that have great impact on individuals mental health. It greatly helps in maintaining equilibrium of hormones and has a positive impact on anxiety, tension, and a sense of well-being reported by Telles et al. [17]. The current study's findings demonstrate a substantial difference in HbA1C

levels between yoga practitioners and non-practitioners for individuals with type 2 diabetes. Aljasir et al. [18] state that his research has shown that yoga can help with both the symptoms and issues related to type 2 diabetes. The research output reveals that yoga plays a vital role in the control of diabetes, and it can significantly improve the well-being of an individual with diabetes.

CONCLUSION

Both patients experience no negative effects and a sense of health in the yoga lifestyle. It can be concluded that yoga can be utilized as an alternative to medical therapy to boost biochemical markers. Additionally, yoga treatment helps diabetic's condition in terms of reducing insulin dosages, maintaining mental and physical focus, and avoiding complications associated with it. Therefore, it is warranted to include yogic practice a part of prevention and maintained of DM and strongly recommend yoga as a major component to treat type 2 Diabetes.

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