

A Review on the Use of Yoga in the Prevention and Management of Diabetes Mellitus

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Abstract: *Yoga is an ancient art or science that is beneficial for the development of the body, mind, and spirit. Diabetes is a group of metabolic disorders that have emerged as a significant global health issue. A variety of ancient texts have referenced the beneficial effects of Yoga in the prevention and management of specific diseases. Currently, it is the subject of contemporary scientific evaluation of this ancient evidence. The objective of the current investigation was to evaluate the efficacy of yoga-based therapy in the treatment of type 2 diabetes mellitus by reviewing published research articles. To compile the most recent information on the impact of yoga on diabetes, a variety of research journals were consulted. In patients with type 2 diabetes mellitus, yoga practice promotes insulin sensitivity and reduces blood sugar levels and insulin resistance. Additionally, yoga has a beneficial impact on the management of weight, blood pressure, and lipid profile in individuals with type 2 diabetes. The beneficial function of yoga in the management of diabetes mellitus was confirmed by this review work*

Keywords: Pranayama, Diabetes mellitus, and NIDDM

I. INTRODUCTION

It is plausible that diabetes mellitus (DM) is one of the earliest diseases that humanity has encountered [1]. The most common form of diabetes, Type 2 DM (non-insulin dependent DM), is defined by hyperglycemia, insulin resistance, and relative insulin deficiency. Genetic, environmental, and behavioural factors are interconnected in the risk determinants of type 2 diabetes [2, 3]. Type 2 diabetes mellitus is a chronic metabolic disorder that has been consistently increasing in prevalence worldwide [4]. India has the highest number of diabetics in the globe, as indicated by data from the International Diabetes Federation (IDF). The global prevalence of diabetes is expected to double from 171 million in 2000 to 366 million in 2030, with India experiencing the greatest increase. By 2030, it is anticipated that diabetes mellitus will affect as many as 79.4 million individuals in India [5]. The term "Yoga" is derived from the Sanskrit word "Yuj," which signifies the union of the body, respiration, and psyche. The potential outcome of correct thought and action may be improved health as a result of Yogic practices [6]. Yoga is frequently represented as a tree and has eight parts, or limbs: Yama (universal ethics), Niyama (individual ethics), Asana (physical postures), Pranayama (breath control), Pratyahara (control of the senses), Dharana (concentration), Dyana (meditation), and Samadhi (bliss) [7]. Yoga, a practice that has been widely practiced in India for a long time, has become more prevalent in Western society. In a national, population-based telephone survey (n/4 2055), 3.8% of respondents reported using yoga in the previous year and gave wellness (64%) and specified health conditions (48%) as the reasons for doing so [8]. High blood pressure, high cholesterol, migraine headaches, asthma, inadequate respiration, backaches, constipation, diabetes, menopause, multiple sclerosis, varicose veins, carpal tunnel syndrome, and numerous chronic ailments have all been alleviated by yoga. Additionally, it has been investigated and authorised for its capacity to alleviate tension and facilitate relaxation [9]. The most compelling empirical evidence indicates that yoga's ability to modulate hormones is a contributing factor to its health benefits, as evidenced by a decrease in cortisol and an increase in serotonin and melatonin levels as a result of consistent practice [10]. Regular yoga practice improves one's awareness of the mind and body, which is essential for the self-management of a diabetes diet and exercise regimen [11]. Nevertheless, there are a limited number of studies that have investigated the use of yoga as a complementary alternative medicine in patients

with diabetes mellitus. This can only be achieved through a comprehensive review, which can serve as a foundation for future research.

II. MATERIALS AND METHODS

This article is a scientific presentation of the data collected from various sources of literature regarding the impact of yoga practice on diabetes.

III. RESULT AND DISCUSSION

A total of 28 male patients aged 30 to 60 who were diagnosed with type 2 diabetes mellitus were chosen. For a six-month period, the subject engaged in yoga or basic pranayama (breathing exercises) for approximately five minutes. Subjects who were not addicted experienced a substantial decrease in their fasting blood sugar levels following six months of yogic exercises. However, neither addicted nor non-addicted diabetes patients experienced any significant changes in their lipid profile or blood pressure [12]. The effect of 40 days of Yogasana was investigated in a study of twenty type 2 diabetic subjects between the ages of 30 and 60. Surya namaskar (sun salutation), Trikonasana (triangle pose), Tadasana (mountain pose), Padmasana (lotus pose), Bhastrika Pranayama (breathing exercise), Pashimottanasana (posterior stretch), Ardhamatsyendrasana (half spinal twist), Pawanmuktasana (joint freeing series), Bhujangasana (cobra pose), Vajrasana (thunderbolt pose), Dhanurasana (bow pose), and Shavasana (corpse pose) were included in the yoga asanas. The aforementioned sequence of yogic exercises, which are performed for 30–40 minutes each day for a period of 40 days. The results indicated a statistically significant decrease in fasting blood glucose (from a baseline of 19.5 mg/dl) and a decrease in postprandial blood glucose (from 19.9 mg/dl) by 20.0 to 171.7P208.3. The decreases in serum cholesterol values from 222.8 to 269.7□295.3 mg/dl were also statistically significant (from 222.8 8.6 mg/dl). The glycosylated haemoglobin decreased from 10.27 0.4% to 207.9 0.5. These results indicate that Yoga 8.68 asanas have a beneficial impact on the lipid profile and glycaemic control in mild to moderate type 2 diabetes [13]. A total of 50 diabetic patients aged 50–65 were randomly selected. Surya namakar, Bhujangasana, and Vajrasana were the yoga asanas that were practiced. Surya namakar was performed 3–7 times, with each turn being held for ten seconds. Bhujangasana was performed 3–7 times, with each turn being held for ten seconds. Vajrasana was performed ¼ to 1 minute, with ¼ minute added to the practice each day. Bhastrika- pranayama, 3–5 minutes per day for Kapalbhathi and 5–7 minutes per day for Bhramari, five times during the day. It was noted that the blood sugar and blood pressure levels of adults were reduced after eight weeks of practicing Asanas and Pranayama. These alterations were observed as a result of yoga exercises and were determined to be within the normal range [14]. Fifty-six patients aged 30–60 years with a history of type 2 diabetes mellitus and a duration of diabetes of 0–10 years were selected. Suryanamskar, Tadasana, Konasana, Padmasana Pranayama, Paschimottansana Ardhamatsyendrasana, Shavasana, Pawanmuktasana, Sarpasana, and Shavasana comprised the yoga asana regimen. The Yoga exercises were conducted for 30–40 minutes on a daily basis for a period of 40 days. The participants were administered oral hypoglycemic medications and adhered to a prescribed diet. The control group, which consisted of 50 type 2 diabetes patients of similar age and severity, were maintained on prescribed medication and engaged in moderate physical activities such as walking. The results of the study indicate that the weight and fat distribution in the body space were reduced in NIDDM patients who engaged in yoga asanas. This was demonstrated by a substantial decrease in the waist-to-hip ratio and a substantial decrease in fasting blood glucose levels. The basal and post-40-day parameters were recorded for comparison. The subjects experienced a decrease in their one-hour postprandial blood glucose level after 40 days of practicing yoga asanas. Additionally, they reported a sense of well-being within 10 days and a reduction in the dosage of their oral anti-diabetic medications [15].

A total of 40 patients were selected and randomly assigned to four groups, each of which contained ten patients. Shankha Prakshalana was administered twice a month for a period of two months in Group A. A set of four selected asanas (Urdhahastasana, Katichakrasana, Udarakarshasana, Bhujangasana) were performed daily for 15 minutes in the morning for the same period. For a period of two months, Spico kalp was administered orally in a dose of 5 gm before each meal, with a glass of water. Shankha Prakshalana and Spico-kalp were administered to Group B, while Spico-kalp was the sole medication administered to Group C. Modern medication was administered under the supervision of a

diabetologist in Group D. In Group A, Pindikodvestana (86.80%), Atinidra (81.81%), Alasya (81.50%), and F.B.S. (77.77%) exhibited marked relief. In Group B, Atinidra (75.81%) and Alasya (78.00%) exhibited marked relief. In Group D, Daurbalya (76.80%), F.B.S. (82.75%), and P.P.B.S. (78.57%) exhibited marked relief. In Group C, patients do not experience significant relief from any symptom [16]. In order to evaluate the efficacy of Pranayama, thirty-five diabetic subjects were thoroughly examined. There were four patients with IDDM who were on insulin, as well as two patients who were on insulin and 24 patients who were taking oral medications. Five cases withdrew out of the investigations. Within a week, all of the patients who were examined experienced a sense of well-being. During the course of the investigation, 17 subjects required a decrease in their oral drug and insulin dosages. There was a substantial decrease in the fasting and post-lunch BSL levels of 26 NIDDM subjects and the four IDDM subjects. An examination of the GTT and IRI estimations in five NIDDM subjects revealed a decrease in blood glucose levels at all points; however, the disparity was not statistically significant. An examination of the I/G ratio in these subjects revealed a substantial decrease in the fasting state, and the I/G ratios were consistent following pranayama [17]. The oral glucose tolerance test (OGTT) was used to investigate the changes in blood glucose and glucose tolerance in 149 non-insulin-dependent diabetics (NIDDM) after 40 days of yoga therapy. The yoga treatment involved the following: (i) visceral cleansing procedures (Jalaneti, Sutraneti, Kunjal, Kapalhati, Shankha Prakshalan); (ii) body postures (Shavasana, Padmasana, Bhujangasana, Matsyasana, ArdhaMatsyendrasana, Yogasana, Mayurasana, Simhasana, Gomukhasana, Shavasana); and (iii) breathing exercise (Pranayama-Uggayi) for 1.5 hours in the morning and 1 hour in the evening. One hundred and four patients demonstrated an acceptable to excellent response to the yoga therapy administered. The decrease in oral hypoglycemia and the subsequent decrease in the number of oral hypoglycemic medications necessary to maintain normoglycemia resulted in a substantial decrease in hyperglycemia and area index total (AIT) [18]. Twenty children and adolescents with type 2 diabetes participated in a 12-week prospective pilot Ashtanga yoga programme. Weight measurements were conducted both prior to and following the programme. The self-concept, anxiety, and depression inventories were completed by all participants at the program's inception and conclusion. The programme was successfully completed by fourteen students, primarily of Hispanic descent, between the ages of eight and fifteen. The typical weight loss was 2 kilogrammes. ($p=0.01$) The weight decreased from 61.2 ± 20.2 kg to 59.2 ± 19.2 kg. Although two of the five students with low self-esteem experienced a decrease in self-esteem, four of them experienced an improvement. The investigation resulted in an improvement in anxiety symptoms [19]. A study was conducted to investigate the impact of long-term yoga practice on the glycemic profile, glycosylated haemoglobin, and normal haemoglobin of diabetics. The experimental group consisted of 120 diabetic patients, with 60 patients participating in yoga and the remaining 60 not participating in yoga. The controls did not practise yoga at all, while the subjects were practicing yoga for over two years. The yoga programme commenced with Surya Namaskar and progressed through a sequence of asanas, including Tadasana, Padahastana, Vrikshasana, Trikonasana, Vajrasana, Vakrasana, Gomukhasana, Paschimottanasana, Pawanamuktasana, and Dhanurasana. In the yoga group, the results indicated a decrease in fasting blood glucose levels ($p=0.0001$), a decrease in glycosylated haemoglobin ($p=0.0001$), and an increase in haemoglobin levels ($p=0.0001$). Yoga is recommended as a complementary therapy for diabetics due to the fact that it induces modifications in hematologic parameters [20]. The study was conducted on 41 middle-aged type-2 diabetic patients who were taking oral hypoglycemic medication. The patients were divided into two groups: (a) 20 patients were on oral hypoglycemic with Yoga-nidra, and (b) 21 patients were on oral hypoglycemic alone. The parameters were recorded every 30th day, and yoga-nidra was practiced for 30 minutes daily for a total of 90 days.

IV. CONCLUSION

Yoga is effective in the treatment of lifestyle diseases that are induced by behaviour, such as diabetes mellitus. The status of diabetics is enhanced through the practice of yoga, which enhances physical and mental alertness, reduces medication dosages, and prevents complications. Pranayama, Suryanamaskar, Tadasana, Konasan, Padmasana, Paschimottanasana, Ardhamatsyendrasana, Pawanmuktasana, Sarpasana, Shavasana, and Ashtangayoga Pranayama were found to be effective in achieving optimal diabetes control, according to the study. Therefore, the status of diabetes mellitus may be prevented and managed through the consistent practice of yoga.

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