

A Review on Yoga Therapy for Diabetes Management

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ABSTRACT

DM acquires pressing clinical and economic significance due to work loss and disability leading to increased expenditures on medicines and hospital stay. Therefore, there is a need to identify cost-effective prevention and management strategies and the use of mind–body therapies may hold promise for its prevention and treatment. Yoga offers holistic solution to the management of type 2 diabetes mellitus and its complications

involving lifestyle changes encompassing kriyas, various asana, changes in diet, management of stress, meditation. Various studies suggest that yoga may improve indices of risk in adults with type 2 DM, including blood sugar levels and reduced resistance to insulin, lipid profiles, anthropometric characteristics. The effect of yoga incorporating asanas, pranayamas, meditation, kriyas, satvik diet, attitudinal and behavioral modification, and mental discipline is beneficial to patients of type 2 Diabetes mellitus.

Keywords: Insulin resistance diseases, Lifestyle diseases, Mind body medicine.

INTRODUCTION

Diabetes mellitus (DM) is plausibly one of the earliest diseases known to mankind. About 3000 years ago it was reported in Egyptian manuscript [1]. In, The difference between type 1 and type 2 DM was made in 1936 [2]. Type 2 DM (non-insulin dependent DM) is the most prevalent form of DM categorized by hyperglycemia, resistance to insulin, and relative deficiency to insulin. The risk determinants of Type 2 DM are interconnected by genetic, environmental and behavioural factors [3,4]. Type 2 DM is characterized by increased morbidity and mortality; it has an insidious onset and late recognition and leads to premature morbidity and mortality. Type 2 DM acquires pressing clinical and economic significance due to work loss and disability leading to increased expenditures on medicines and hospital stay.

Evidently, there is a need to identify cost-effective prevention and management strategies for type 2 DM that address the multiple interrelated factors underlying this increasingly common disorder. There is a strong impact of psychological and social factors on the progression from Insulin Resistance Syndrome to type 2 DM. The mind–body discipline of yoga has been widely used in India for the management of diabetes and related chronic insulin resistance conditions [5-9]. In adult diabetic patients, yoga therapy has shown more beneficial effects and very few adverse effects [10]. Still, the researches on yoga therapy as a complimentary alternative medicine in patients of diabetes mellitus are few. As yoga is holistic living incorporating social and lifestyle changes which are subjective measurements therefore, studies on the contribution of yoga in

preventing and reducing complication of lifestyle diseases like diabetes are even fewer.

Yoga offers holistic solution to the management of type 2 diabetes mellitus and its complications. Yogic management of diabetes mellitus involves lifestyle changes encompassing kriyas, various asana, changes in diet, management of stress, meditation and leading a holistic life. The comprehensive yoga, an approach incorporating body postures (asanas), breathing techniques (pranayamas), meditation (affecting the manomayakosa), cleansing (kriyas), nutrition (satvik diet), attitudinal and behavioral modification, and mental discipline, (affecting the vijnanmaya and anandamayakosha) is more beneficial and loyal to its ancient inhabitants [11-14].

AIMS

The objective of this review is primarily to review the published research literature for the effectiveness of yoga-based therapy as a modality for diabetes management and to examine important factors in the social environment that affect the practice of yoga, leading to a change in life style and health behavior among adults with or at risk for type 2 diabetes mellitus.

The Effects of Yoga on Markers of Insulin Resistance

The studies assessing the effects of yoga on insulin resistance markers in patients of type 2 DM have documented considerable improvement in one or more clinical post-intervention measures following the practice of yoga either alone or in combination with other therapies

and reported significant improvement post-intervention in indices of insulin resistance relative to baseline values. In patients of diabetes mellitus undertaking yoga therapy the fasting blood sugar levels as well as post prandial blood sugar levels are reduced significantly and glycaemia levels are also maintained better. This finding has been corroborated in many research articles wherein the effect of yoga therapy on diabetes mellitus is studied [15,16]. Manjunatha et al., [17], observed decreased insulin resistance with the practice of asanas. Various studies have documented reductions in fasting and post-prandial blood glucose levels [5,8,13,18-26] and in fasting glycosylated hemoglobin.

Few studies also evaluated and reported reduction in fasting glucose and fructosamine [27] among subjects receiving a yoga-based intervention versus controls receiving enhanced usual care.

The reduction in fasting blood glucose is ranging from 6.1-34.4% in various studies [8,20-26]. Decrease in the resistance to insulin and increase in the sensitivity to insulin with increased glucose uptake in patients of diabetes mellitus type 2 undergoing yoga therapy regimen was reported by Sahay [5]. The life style diseases i.e. insulin resistance syndrome, cardiovascular diseases and atherosclerosis which affect the manomayakosha leading to stress causing an activation of sympathetic nervous system and decrease in parasympathetic tone are benefitted with the practice of holistic living of yoga.

The Effects of Yoga on Blood Lipid Profiles

Many studies have assessed the potential effects of yoga on blood lipid levels; all proposed that the practice of yoga and yoga-based programs may alter lipid profiles towards betterment [8,13]. The changes in blood lipid fractions included reductions in cholesterol triglycerides low-density lipoprotein (LDL) and very LDL (VLDL) levels, increases in high density lipoprotein (HDL) levels and reduced LDL/HDL ratio relative to baseline levels and/or control values [8,13,26,28]. An increase in the level of insulin with better uptake of glucose associated with redistribution of fat and reduction in the ratio of waist – hip was observed in type 2 DM patients practicing yoga asanas by Malhotra et al., [15].

Various studies have reported the multi-dimensional beneficial effect of yoga on the Pranamayakosa and manomayakosha to correct the imbalances caused by stress leading to positive changes in physique, anxiety scores and endocrine levels. Manchanda and Narang [29] reported reduction in total serum cholesterol, serum triglycerides and low density lipoproteins (LDL) in patients following the yogic lifestyle for twelve months. Sahay [5] and Bijlani [13] also observed decrease in VLDL, LDL and free fatty acids and increase in HDL in patients undergoing yoga therapy. There was reduction in the coronary artery bypass procedures with fewer episodes of angina. The patients who practiced a yogic lifestyle also showed reversal of lesions [16]. Vyas [30] reported that meditation which involves dharna dhyana has a beneficial effect on blood pressure and also reduces serum cholesterol levels.

The positive response of yoga in the management of hyperlipidemia and obesity cannot just be assigned only to the increased expenditure of calories as yoga does not comprise of generation of energy and accelerated muscle activity. Dyslipidemia is usually associated with the abnormalities in lipolysis; triglyceride metabolism and free fatty acid turn over in a case of insulin resistance. Insulin resistance in diabetes results from impaired lipoprotein lipase and due to enhanced hepatic lipase activity. Impaired insulin secretion have been associated with chronic exposure to elevated free fatty acids. The lipid profile is improved with practice of yoga mostly due to increased levels of hepatic lipase and lipoprotein lipase. This would lead to an increase in the uptake of triglycerides by adipose tissue and also alter lipoprotein metabolism [31].

Yoga and Anthropometric Measurements

Various studies identified reported declines in body weight [18,32-34], reductions in ratio of waist/hip [26], following yoga-based interventions ranging from 40 days [26] to 12 months. Littman et al., [35] also reported decrease in weight diameter in randomizes control trial in obese and overweight breast cancer survivors. Sahay and Shirley T et al., [5,36] also reported considerable decrease in weight, BMI and ratio of waist/hip. Haldar et al., [37] found that Body weight, body mass index and fat% were decreased significantly withhatha yoga. Neck circumference reduced in age group of 40 – 49 years. Chest circumference, back leg and grip strength, and flexibility improved considerably. They concluded that Hatha yoga can improve anthropometric characteristics, muscular strength and flexibility and can also be helpful in preventing and attenuating age related deterioration of these parameters.

The Effects of Yoga on Blood Pressure

Schmidt T et al., [33] reported significant improvement in both systolic and diastolic blood pressure as compared to baseline values in patients of type 2 diabetes mellitus who undertook comprehensive residential three month kriya yoga training and vegetarian nutrition. The study interventions emphasized on a yogic vegetarian diet, kriya yoga, stress management and group support. Similar, findings of reduction in systolic and diastolic blood pressure in patients of type 2 diabetes mellitus and coronary heart disease were also endorsed by [8,19,20, 31] other studies. Savita et al., [38] observed the beneficial effect of meditation in patients of hypertension; however it was also observed that this effect lasts till the patient practices meditation. The patients of type 2 DM and hypertension also showed remarkable improvements after two to three weeks of yoga practice by a decrease in both systolic and diastolic blood pressure associated with reduction in dose of antihypertensive medication.

Influence of Yoga on Other Indices

A three months controlled clinical trial done on type 2 diabetes mellitus patients concluded that Yoga can be used as an effective therapy in reducing oxidative stress in type 2 diabetes. The practitioners of Yoga at 3 months achieved significant improvements in basal metabolic index (BMI), HbA1c, malondialdehyde, vitamin and glutathione, as compared to the standard care group [39].

Another Study done on the effect of yoga asanas in assessment of pulmonary function in type 2 DM patients suggested that improved glycaemic control and pulmonary functions were obtained in NIDDM cases with yoga asanas and pranayama [40].

Influence of Yoga on stress and anxiety

An interventional study done on patients who had a history of diabetes mellitus, obesity, psychiatric disorders (stress, anxiety, depression), gastrointestinal tract problems (acid reflux, duodenal ulcers)hypertension, coronary artery disease, revealed that anxiety scores of both types of anxiety i.e. about an event and anxiety level as a personal characteristics were reduced. The yogic intervention involved asanas, pranayama, counselling individually and in groups for lifestyle and attitude modifications, meditation and discussions on philosophy and importance of yoga, satvik diet smooth management of excessive tension and yoga therapy for the relevant disease. The outcome measures were anxiety scores based on State-Trait Anxiety Inventory (STAI), a psychological inventory based on a 4-point Likert scale and consisted of 40 questions, taken on the first and last day of the course and the observations suggested significant reduction in the anxiety scores [41]. Another study done on subjects with type 2 diabetes mellitus with yoga practice for 40 days resulted in reduced BMI, improved well being, and reduced anxiety [42].

CONCLUSION

To conclude, many studies including the stop diabetes movement by yoga therapy suggest that yoga therapy has a beneficial effect in patients of type 2DM in terms of reducing the blood sugar levels and insulin resistance and increasing the sensitivity to insulin. Yoga also has a positive effect on lipid profile, management of weight and blood pressure in type 2 DM. In adults with diabetes data indicates that yoga may improve coagulation profiles and pulmonary function, reduces oxidative damage, and decrease sympathetic activation. The effect of yoga therapy on reducing the dose of drug required for management of hypertension and other cardiovascular complications in patients of type 2 diabetes mellitus has also been documented in a few studies.

Yoga therapy is effective in promoting health and management of diabetes and yields manifold benefits with very few adverse effects. However, any single intervention is not adequate to as certain long-term behavior change. Environmental and social factors, yoga, and other lifestyle changes are also important for optimal management of diabetes. However high-quality randomized control trials are needed to validate and explain the effects of standardized yoga programs in patients with type 2DM.

To conclude Yoga is a valuable adjunct to treating a variety of disorders which are effectively behaviourally induced lifestyle diseases including diabetes mellitus. Therefore, Yoga practices should be incorporated as an adjunct treatment, as a mind-body therapy in co-ordination with allopathic medicine as it has the potential to enhance its beneficial effects.

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