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Effect of Asana Pranayama with Sun salutation on type 2 Diabetic Mellitus management among middle aged men

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INTRODUCTION

Diabetes mellitus is a pandemic disease and one of the leading threats to human health. Type 2 diabetes is a long-term condition in which your body can't control the amount of glucose (sugar) in your blood. If you have type 2 diabetes, your body doesn't respond properly to a hormone called insulin. Or it may be that your body is not able to produce enough insulin. In either case, the result is that your blood glucose level becomes too high. Type 2 diabetes develops when the body does not use insulin efficiently and gradually loses the ability to make enough insulin.

Insulin is a hormone that controls the amount of glucose in the blood. Insulin helps glucose produced by the digestion of carbohydrates move from the blood into the body's cells where it can be used for energy. Type 2 diabetes is a common lifestyle disorder caused by insulin resistance with relative or absolute insulin deficiency, resulting in chronic hyperglycaemia and various cardiovascular complications. Sedentary habits and unhealthy dietary patterns are the major risk factors for the development of various lifestyle disorders, including diabetes. Psychological stress also increases the risk and severity of diabetes. Lack of physical activity was found to increase the risk of diabetes by 3 times and the risk of coronary artery disease by 2.4 times. Dietary control and exercise are established treatment modalities in patients with type 2 diabetes and other lifestyle disorders, including obesity, hypertension, and dyslipidaemia. Urbanization, the intake of calorie-rich food, use of various machines, less open space for exercise, a busy modern lifestyle, and lack of motivation reduce the likelihood of adherence to dietary control and exercise as a management option in people with diabetes. Moreover, individuals with diabetes have a reduced capacity to engage in exercise because of overweight, physical unfitness, sedentary lifestyle, limited joint mobility, and other diabetes-related complications, including cardiovascular disease,

peripheral neuropathy, and diabetic foot problems. Several studies have shown that poor adherence to diet and exercise programs were major limitations in the implementation of non-pharmacological treatments of diabetes.

This type of diabetes can occur when:

- The body develops “insulin resistance” and can’t efficiently use the insulin it makes.
- The pancreas gradually loses its capacity to produce insulin.

In a mild form, this type of diabetes can go NON diagnosed for many years. That’s cause for concern since untreated diabetes can lead to many other health problems. Type 2 diabetes is due to increased insulin resistance, associated with weight gain, inactive lifestyles and poor diet.

Type 2 diabetes is more frequently found in men, especially at ages of 35-54, where men are twice as likely to develop diabetes, with onset at a much lower average BMI. The androgen hormone ‘testosterone’ is vital in male puberty. It stimulates the growth of muscles and hair, vocal changes and genital development. This hormone is also important throughout the life of a man, aiding the production of sperm and maintenance of libido. Research has recently shown that there is link between this hormone and in men, with lower testosterone levels leading to a greater risk. Type 2 diabetes has a direct correlation with increased risk of visceral fat deposition. Research has also shown that low testosterone levels in men can increase e visceral fat deposition, leading to increased type 2 diabetes. This is particularly worrying as $1/6^{th}$ of all males have low testosterone, which leads to poor muscle formation, increased fat storage, and leads to a dramatic increase in diabetes risk.

Symptoms of Type 2 diabetes:

- A decreased sex drive
- Erectile dysfunction
- Poor muscle strength
- Blurred vision
- Fatigue
- Felling very hungry or thirsty
- Increased need to urinate(usually at night)
- Slow healing of cuts or sores.
- Unexplained weight loss
- Tingling or numbness in hands or feet

Causes Type 2 Diabetes:

.Life style disorder

.Family history

.Hormones disorder

.Medicine reaction

.Stress

.Bad food habit

Complications associated with diabetes include:

- Heart disease, Heart attack and Stroke
- Neuropathy
- Nephropathy
- Retinopathy
- Hearing loss
- Foot dame or some infections and sores don't heal
- Skin condition, such as bacterial and fungal infection
- Depression

Yoga

Yoga, which originated in India and, aims at balancing and harmonizing the body, mind, and emotions. Increasing evidence suggests that yoga practice tackles the pathophysiologic mechanisms of diabetes and helps in controlling diabetes and its complications. In this short review, we briefly describe the role of various yoga practices in the management of diabetes based on evidence from various clinical studies. Yoga has multiple components – including a healthy lifestyle. Extensive research has explored changes in bio-chemical, electrophysiological, cellular, genetic, neuromuscular, and Radiological parameters related to yoga practice.

Yoga therapy consists of 4 components including Postures, Prnayama, Sun salutation and meditation. Yoga Postures improve sensitivity of cells of pancreas to glucose signal and also the improvement in insulin secretion,

Improvement in lipid level due to increased hepatic lipase and lipoprotein lipase at cellular level increased uptake of triglycerides by adipose tissues thereby increases the utilization and metabolism of glucose in peripheral tissues, liver and adipose tissues. Pranayama bring new homeostasis in the body.

Regular practice of yoga postures confers benefits for glucose control, oxidative stress, inflammatory response, and sleep quality in patients with type 2 diabetes (T2D), a study has found. Yoga postures involve stretching/twisting movements and relaxation, focusing on the synchronization of breathing and movement. Poses with forward bends massage and pressurize the pancreas and stimulate the secretion of insulin. On the other hand, twisting poses squeeze the intestines and massage them to prevent the stagnation of colonic contents.In patients with T2D, alternating abdominal contractions and relaxations involved in yoga may rejuvenate pancreatic cells and increase pancreatic β-cell. Furthermore, they can help improve blood supply to muscles, which in turn enhances insulin receptor expression in the muscles and causes increased glucose uptake.

Yoga Postures, Pranayama, Sun salutation and Meditation is very helpful for type 2 Diabetic Mellitus.

Blood circulation is also increased by congruence, so your glands begin to function at their maximum capacity.This pose will help control blood sugar, metabolize sugars, and improve pancreas function.

Pranayama

Pranayama is controlled or regulated yogic breathing practice. The slow breathing technique in *pranayama* causes comprehensive changes in body physiology by controlling the autonomic nervous system; it regularizes the rate and pattern of breathingand regulates the heart rate and its variability. Slow breathing with around six breaths every minute triggers a parasympathetic nervous system response which improves oxygenation by expanding the bronchioles' pathways in the lungs. This, in turn, reverses insulin resistance and decreases blood glucose level. A continuous 6-month practice has been shown to reduce blood glucose level, improve quality of life and prevent cardiac neuropathy.Pranayama decreases physiological stress by reducing blood pressure and heart rate along with reducing stress-inducing hormones like adrenaline and cortisol. Dysfunction of the nervous system is related to obesity, poor heart, respiratory fitness, insulin resistance, and hypertension.

Doing this breathing exercise a few times in day reduces hunger pangs & quenches thirst. It relieves you from stress & anxiety through its soothing & relaxing effect.It also helps in lowering blood pressure.

The sun salutation, *How yoga helps in diabetes*

The authors found a significant increase in the acute phase of insulin release which was paralleled by increases in c-peptide levels in the yoga group as compared to the control group after 3 months of intervention. Increases in GLP-1 and beta-cell function were also recorded, as were improvements in insulin resistance and measures of heart rate variation in those in the yoga protocol group. Perceived stress levels in the yoga group shifted from severe at the start of the study to moderate at the end, whereas the walking controls had no change. Lastly, the authors found that stress levels were positively correlated to beta-cell function.

AIM OF THE PAPER

The paper aims to observe through study of how yoga asana, pranayama, sun salutation practice can actually help and control Diabetic Mellitus management among middle aged man.

The patients were trained over 20 weeks one hour in morning and half hour in evening. They have been joined the training session without any external pressure. The significant improvement showed by report. Out of 30 patients 26 patients are had well development. Rest of the four patients unable to continue their practice due to lot of personal reasons.

Training schedule

SN	NAME	DURATION	RLAXATION TIME	REPATATIONS	REMARK
1.	**SURYANAMASKAR**		**1minutes**	**5 Round**	**1.40**
2	**PAWANAMUKTASANA**	**50SEC**	**10 SEC**	**2 Round**	**2MINT**
3	**SETHUBHANDANASANA**	**50SEC**	**10 SEC**	**2 ROUND**	**2MINT**
4	**BHUJANGASANA**	**50 SEC**	**10 SEC**	**2 Round**	**2 MINT**
5	**DHANURASANA**	**50SEC**	**10 SEC**	**2ROUND**	**2MINT**
6	**SASANKASANA**	**50SEC**	**10 SEC**	**1**	**50SEC**
7	**MATSYENDRASANA**	**50SEC**	**10 SEC**	**2 ROUND**	**2MINT**
8	**PASCHIMOTTANASANA**	**50SEC**	**10 SEC**	**2ROUND**	**2 MIN**
9	**PADAHASTASANA**	**50SEC**	**10 SEC**	**2ROUND**	**2MIN**
10	**HALASANA**	**50SEC**	**10 SEC**	**1ROUND**	**1MIN**
11	**SARVANGASANA**	**3MIN**		**1ROUND**	**3MIN**
12	**MATSYASANA**	**90min**		**1ROUND**	**90MIN**
13	**RELAXATION**	**2min**			

BREATHING EXERCISES

SN	NAME	DURATION	RELAXATION	REPATATION	
1	**KAPALABATHI**	**4 MIN**			
2	**CHANDRABEDI**	**3 MIN**			
3	**NADISHODANA**	**3 MINT**	**1MIN**	**-**	
4	**SHITALI**	**3 MINTS**	**30SEC**	**-**	
4	**BHRAMARI**	**4 MINTS**	**30SEC**	**-**	
5	**BHASTRIKA**	**4 MINTS**	**2 MIN**	**-**	

1	**RELAXATION AND MEDITATION 20MINTS**

Results:

Research Studies have demonstrated the effectiveness of yogic asana, pranayama and sun salutation have been improved the physical and psychological variables. There is a significant improvement shows after successful training

Methods: Approaches. Councelling and yoga pranayama and sun salutation practice

CONCLUSIONS:

Yoga asana, sun salutation and pranayama are well qualified tool for type 2 diabetes management . The scientific evidence suggests the potential role of yoga based lifestyle modifications in the management of type 2 diabetes and its associated risk factors. It is suggested that psycho-neuron-immune mechanisms have holistic effects in diabetes control. Parasympathetic activation and the associated anti-stress mechanisms improve patients' overall metabolic and psychological profiles, increase insulin sensitivity, and improve glucose tolerance and lipid metabolism.

LIMITATIONS OF STUDIES ON YOGA:

There are many lacunae in the clinical trials conducted to study the effects of yoga on health and various diseases. A lack of proper control groups, small numbers of patients, and short durations of the studies are the major limitations of the clinical trials that have investigated the therapeutic role of yoga in controlling diabetes. Additionally, some of the studies only considered blood sugar levels as outcomes, neglecting the other possible benefits of yoga.

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