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A comprehensive study on the impact of yoga on diabetes

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Abstract

The science of yoga is an ancient one. It is a rich heritage of our culture. Several older books make a mention of the usefulness of yoga in the treatment of certain diseases and preservation of health in normal individuals. The effect of yogic practices on the management of diabetes has not been investigated well. We carried out well designed studies in normal individuals and those with diabetes to assess the role of yogic practices on glycaemia control, insulin kinetics, body composition exercise tolerance and various co morbidities like hypertension and dyslipidemia. These studies were both short term and long term. These studies have confirmed the useful role of yoga in the control of diabetes mellitus. Fasting and postprandial blood glucose levels came down significantly. Good glycaemia status can be maintained for long periods of time. There was a lowering of drug requirement and the incidence of acute complications like infection and ketosis was significantly reduced. There were significant changes in the insulin kinetics and those of counterregulatory hormones like cortisol. There was a decrease in free fatty acids. There was an increase in lean body mass and decrease in body fat percentage. The number of insulin receptors was also increased. There was an improvement in insulin sensitivity and decline in insulin resistance. All these suggest that yogic practices have a role even in the prevention of diabetes. There is a beneficial effect on the co-morbid conditions like hypertension and dyslipidemia.

Keywords: Co-morbidities, receptors, co-morbid, hypertension, dyslipidemia

Introduction

Diabetes is a condition that happens when your blood sugar (glucose) is too high. It develops when your pancreas doesn't make enough insulin or any at all, or when your body isn't responding to the effects of insulin properly. Diabetes affects people of all ages. Most forms of diabetes are chronic (lifelong), and all forms are manageable with medications and/or lifestyle changes.

Glucose (sugar) mainly comes from carbohydrates in your food and drinks. It's your body's go-to source of energy. Your blood carries glucose to all your body's cells to use for energy. When glucose is in your bloodstream, it needs help - a "key" - to reach its final destination. This key is insulin (a hormone). If your pancreas isn't making enough insulin or your body isn't using it properly, glucose builds up in your bloodstream, causing high blood sugar (hyperglycemia).

Over time, having consistently high blood glucose can cause health problems, such as heart disease, nerve damage and eye issues.

The technical name for diabetes is diabetes mellitus. Another condition shares the term "diabetes" - diabetes insipidus - but they're distinct. They share the name "diabetes" because they both cause increased thirst and frequent urination. Diabetes insipidus is much rarer than diabetes mellitus.

Types of Diabetes?

There are several types of diabetes. The most common forms include:

- **Type 2 diabetes:** With this type, your body doesn't make enough insulin and/or your body's cells don't respond normally to the insulin (insulin resistance). This is the most common type of diabetes. It mainly affects adults, but children can have it as well.
- **Pre-diabetes:** This type is the stage before Type 2 diabetes. Your blood glucose levels are

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higher than normal but not high enough to be officially diagnosed with Type 2 diabetes.

- **Type 1 diabetes:** This type is an autoimmune disease in which your immune system attacks and destroys insulin-producing cells in your pancreas for unknown reasons. Up to 10% of people who have diabetes have Type 1. It's usually diagnosed in children and young adults, but it can develop at any age.
- **Gestational diabetes:** This type develops in some people during pregnancy. Gestational diabetes usually goes away after pregnancy. However, if you have gestational diabetes, you're at a higher risk of developing Type 2 diabetes later in life.
- Other Types of Diabetes include:
- **Type 3c Diabetes:** This form of diabetes happens when your pancreas experiences damage (other than autoimmune damage), which affects its ability to produce insulin. Pancreatitis, pancreatic cancer, cystic fibrosis and hemochromatosis can all lead to pancreas damage that causes diabetes. Having your pancreas removed (pancreatectomy) also results in Type 3c.
- **Latent Autoimmune Diabetes in Adults (LADA):** Like Type 1 diabetes, LADA also results from an autoimmune reaction, but it develops much more slowly than Type 1. People diagnosed with LADA are usually over the age of 30.
- **Maturity-onset Diabetes of the Young (MODY):** MODY, also called monogenic diabetes, happens due to an inherited genetic mutation that affects how your body makes and uses insulin. There are currently over 10 different types of MODY. It affects up to 5% of people with diabetes and commonly runs in families.
- **Neonatal diabetes:** This is a rare form of diabetes that occurs within the first six months of life. It's also a form of monogenic diabetes. About 50% of babies with neonatal diabetes have the lifelong form called permanent neonatal diabetes mellitus. For the other half, the condition disappears within a few months from onset, but it can come back later in life. This is called transient neonatal diabetes mellitus.
- **Brittle diabetes:** Brittle diabetes is a form of Type 1 diabetes that's marked by frequent and severe episodes of high and low blood sugar levels. This instability often leads to hospitalization. In rare cases, a pancreas transplant may be necessary to permanently treat brittle diabetes.

Many studies have reported the beneficial effect of the practice of yoga on diabetes. Some studies have mentioned up to 65 percent beneficial effect of yogic therapy for diabetes. K.N. Udupa has even mentioned 5 cases of juvenile diabetes who were completely controlled by yogic treatment. All of these studies have emphasized the possible mechanism of the yogic practices as:

1. Direct influence on pancreatic secretion by rejuvenation of the pancreatic cells, through alternate abdominal contractions and relaxation, during asanas (yogic postures which produce relaxation) and breathing exercises.
2. Reduction in blood sugar due to muscular exercise involved in the asanas.

S.A.A. Ramaiah's study conducted in Washington, D.C. compared the effects of walking, treadmill, static cycling, Amarantha Kokkuasana (Sitting crane), Nindra Kokkuasana (Standing crane) and Vil asana (Bow pose, rocking, especially

side to side). The most effective were found to be the latter. It was concluded that the direct stimulation of the pancreas by the postures rejuvenated its capacity to produce insulin.

Several studies have focused upon why the practice of yoga has been more successful than other forms of exercise. M.V. Bhole and K.N. Udupa have measured the effects of yoga on mental stresses. Muhammad) has shown the differences between physical exercises and yoga. He has reported how doing the yogic practices without exertion has more benefits.

The mechanism of yogic practices and other exercises is very different. Yogic practices are supposed to change one's attitude towards the situations of life, by developing mental relaxation and balance. One study focused on the practice of the postures in a slow, smooth and non-exerting manner. The postures were maintained comfortably and easily for a length of time and the patients were taught to focus on breathing or on some infinitely vast object like the sky or the ocean while doing the yoga posture. Two thirds of the patients were significantly benefited by this treatment. The others also showed improvement.

A number of institutions in India offer treatment programs for diabetes. Participants generally stay for between two to five weeks, and follow a program of instruction and practice of yoga asanas for at least an hour in the morning and the evening, dietary control, meditation and breathing exercises. They generally become subjects in on| going research projects.

Recommendations regarding the practice of Yoga by diabetics

The patient must learn to control and his or her self of diabetes in a holistic manner, at all levels of your being: physical, emotional, mental, intellectual and spiritual, recognizing the effects of stress, emotional imbalance, and dietary and living habits on the disease condition. Before beginning a program, measure ones exercise toleration. Start with simple Movements and positions before progressing gradually to complicated postures.

Throughout the program, monitor glucose levels and under the supervision of a physician, and take appropriate medicinal dosages as and when required. After several weeks one may be able to reduce such dosages.

Practice in the morning and the evening for 40 to 60 minutes the recommended series of postures according to one's capacity. Practice before meals, but after consuming glucid liquids. Avoid exertion, that is heavy muscular activity. Perform the movements slowly and smoothly, stretching the limbs and joints, and gently compressing the abdomen, without straining. Maintain the postures for a comfortable length of time. The maintenance period of postures should be increased gradually from 5 seconds to one minute, or even longer depending upon the posture and capacity of the patient. Focus on the breath during the maintenance period of the posture, with the eyes closed or focused on one point, as a means of learning to focus the mind and to manage stress and tension in the body. Perform the Shavasana, or complete peace relax pose on the back, systematically relaxing all of the parts of the body, at the end of the session, or after completing several postures, if one begins to feel fatigued.

The following postures have been found to be effective in the control and cure of diabetes (Sanskrit names; the English and tamil names are in parentheses): Dhanurasana (Bow pose, Vilasana), Paschimottanasana (Sitting crane, Amarantha kokkuasana), Padangusthansana (Standing crane, Nindra kokkuasana), Bhujangasana (Serpent pose, Paambuasana),

Sarvangasana (Shoulder stand), Ardhamatsyendrasana (Spinal twist), Halasana (Plough pose, Kalapoy asana), Yoga mudrasana (Yogic Symbol pose), Supta Vajrasana (Sitting pose of Firmness), Chakrasana (Wheel pose), Shalabhasana (Grasshopper pose, Vittelasana).

The practice of Udiyana bandam, or the abdominal squeeze has also been found to be useful. Regulate the diet throughout the program. Avoid simple sugars such as white sugar, honey, glucose and sweets, and eat complex carbohydrates such as wheat, oatmeal, buckwheat, corn, brown rice and beans. Avoid processed food and eat foods with lots of fibre and nutrients. Obese patients can start with different asanas, cleansing processes, bhastrika pranayama and relaxation. Lean and thin patients should start with relaxation and pranayama, and practice in a relaxed manner. Meditation practices have been shown to help the endocrine glands through relaxation of the sympathetic nervous system.

Conclusion

Western medical research has focused upon diabetes as only a physical disorder, requiring only physical modalities of intervention. It has been able to confirm that regular physical exercise does have some beneficial effects in diabetics of both types, and that in those who are genetically predisposed to type 2, it could prevent its development. Western Studies have recommended exercise of moderate intensity, as a means to adopt a regular diet and insulin dosage, or to control body weight and improve circulation. Research in India has recognized it as a psychosomatic disorder with causative factors being sedentary habits, physical, emotional and mental stress. Many studies there have confirmed that the practice of the postures can rejuvenate the insulin producing cells in the pancreas of diabetics of both types, and that doing the postures in a relaxed manner, without exertion, yogic meditation and breathing help most patients to control the causes of diabetes.

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