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Case Study

EFFECT OF *TENNETTI-TILLA* (DRIED FIGS AND SESAME SEEDS LADDU) SUPPLEMENTATION IN TYPE 2 DIABETES

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ABSTRACT

Diabetes mellitus is a metabolic disorder affecting every age group worldwide. Sedentary lifestyle, obesity and lack of physical activity are the main causes of type 2 diabetes. Hyperglycemia is not controlled; it may result in macrovascular and microvascular complications which are the major causes of morbidity and mortality in diabetic patients. Doing exercise regularly and consumption of low-calorie diet can help diabetic patients in keeping blood glucose levels under control. Present case study was a 67-year-old woman who was diagnosed with type 2 diabetes. Her anthropometric measurements were recorded as height was 152 cm, weight was 70.75 kg and BMI was 30.4 kg/m^2. Her biochemical parameters are HDL is 38, triglycerides are 163, and cholesterol is 184, VLDL is 33, FBS is 115mg/dl, PLBS is 250mg/dl and HbA1c is 9.5mg/dl. She was supplemented with 10gm of *Tennetti-tilla* (dried fig and sesame seed laddu) daily for 90 days. After the period of intervention of 90 days, the changes observed as reduction in weight to 68kg, FBS 87mg/dl, PLBS 106, cholesterol is 188, triglycerides are 71, HDL is 45, and HbA1c is 6.3 and VLDL is 14.2mg/dl. The study reveals that supplementation of 10g of *Tennetti-tilla* (dried fig and sesame seed laddu) for 90 days can reduce hyperglycemia in type 2 diabetic patients.

INTRODUCTION

Diabetes mellitus is an endocrine metabolic disorder characterized by deficient insulin production (type 1) or combined resistance to insulin action and the insulin-secretory response (type 2) results in increased blood glucose levels. Initially, it presents with symptoms of polyuria, polydipsia, polyphagia and weight loss [1]. Causes may be genetics, lifestyle, infection of pancreas, age related[1]. Globally prevalence of diabetes was estimated to be 2.8% in 2000 and 4.4% in 2030. The total number of people with diabetes is projected to rise from 171 million in 2000 to 366 million in 2030. The prevalence of diabetes is higher in men than women.

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In India 77 million individuals suffer from diabetes in 2019 and this number may be expected to rise to 134 million by 2045.[11]

If initial conditions are not controlled or neglected, it may result in macro vascular (cardiovascular, cerebrovascular and peripheral artery disease) and micro vascular (diabetic retinopathy, nephropathy and neuropathy complications). [2,3]

Due to the urbanized lifestyle diabetic convalescents, to keep the condition under control and to get immediate relief adopting to anti hypoglycemic oral medicines, insulin injections, and strict diet restrictions. Though they give symptomatic relief, on long run use they may show adverse effects.

To overcome these effects along with medication, noninvasive methods like yoga and intake of natural supplements [4] will help in preventing the long run complications of diabetes like hypertension, cardiovascular diseases, adverse effects on organs like kidneys, eyes and on nervous system.

Based on this the present case study on supplementation of natural product *Tennetti –Tilla* (dried fig and sesame seeds laddu) has been undertaken.

Case Study

A 67-year-old woman, a known case of Type II diabetes consulted at nature cure hospital with chief complaint of weakness, muscle cramps, constipation, uncontrolled fasting, post lunch sugar, and HbA1c since 5 years.

As she was interested in intake of natural product be part of study, explained about the *Tennetti-tilla*, its benefits and duration of intake in her own understanding language. As she was satisfied with the study protocol a written consent was taken before giving the product.

A detailed personal history was taken which includes her anthropometric measurements and vital data was recorded as

Height: 152cm, Weight: 70.75kg. BMI: 30.4kg/m^2, BP: 110/70 mm hg, Pulse rate: 74/minute

Fasting blood glucose level=115 mg/dl, Post prandial blood glucose=250 mg/dl, Hb A1c= 9.5 mg/dl.

10 grams of *Tennetti Tilla* was given every day early in the morning along with her medication for a period of 3 months.

Figure 1: *Tennetti-tilla* (dried figs and sesame seeds laddu)

RESULTS

After 90 days of regular intake of the product repeated the biochemical investigations and changes were observed as Fasting blood glucose level=87 mg/dl, Post prandial blood glucose=106 mg/dl, Hemoglobin A1c= 6.3 mg/dl, Weight= 68kg.

Table 1: Showing blood glucose levels before and after supplementation

Before supplementation	After supplementation
Fasting blood glucose level=115 mg/dl	Fasting blood glucose level=87 mg/dl
Post prandial blood glucose=250 mg/dl	Post prandial blood glucose=106 mg/dl
Hemoglobin A1c= 9.5 mg/dl	Hemoglobin A1c= 6.3 mg/dl
Weight= 70.75 kg	Weight= 68 kg

DISCUSSION

Diabetes can be controlled by consumption of low glycemic index foods[7] such as green vegetables, most fruits, raw carrots, kidney beans, chickpeas, lentils etc and doing regular proper exercise like yoga, pranayama. As they help in utilization of the excess glucose by the skeletal muscle. Apart from this natural supplementary product can also show more effect on hyperglycemia. The same happened in the present case study.

Regular intake of 10g of supplement has shown reduction of biochemical values FBS 115mg/dl to 87mg/dl, PLBS 250mg/dl to 106mg/dl, HbA1c= 9.5mg/dl to 6.3mg/dl. On regular intake the *Tennetti-tilla* (dried figs and sesame seeds laddu) has anti-hyper glycemic properties increases the plasma insulin levels and absorption of glucose by skeletal muscles [5,6].

Tennetti-tilla has antioxidant, anti-inflammatory properties which help in enhancing insulin production. As its low glycemic index and rich fiber content metabolized slowly, the sugar levels are in control. [10]

The hypoglycemic effects of sesame may be explained by multiple potential mechanisms. Sesame can inhibit the augment of blood glucose by playing a role in increasing glycogen production.[8] It is rich in protein, magnesium and fibre helps in stabilizing the carbohydrates, in build up the worn out cells as it is the muscle wasting disease, mineral in the sesame seeds helps in preventing the diabetic comorbidities like hypertension, CAD, dyslipidemia.[9] Several studies have reported that regular consumption of sesame a significant control in the glycemic condition as it decreases the function of beta cell function along with the gamma glutamyl transferase. They have antioxidant capacity thereby help in the inflammatory condition [10].

As discussed above by reviewing scientific studies on individual ingredient has shown effect on the hyperglycemic condition. The present study plant-based supplement *Tennetti–Tilla*, a combined product of dried figs and sesame seeds formulation (laddu) had shown a remarkable reduction of HbA1c levels fasting and post prandial glucose levels, serum triglycerides, increased HDL.

CONCLUSION

The present study revealed that supplementation of a natural product with no side effects can bring the uncontrolled type 2 diabetes to normal level. Studies should be extended to large sample size.

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