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CASE REPORT OPEN ACCESS

# AMELIORATING EFFECT OF TENNETTI-TILLA (DRIED FIGS AND SESAME SEEDS LADDU) ON TYPE 2 DIABETIC CONVALESCENTS-A CASE STUDY

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**ABSTRACT:**

Diabetes mellitus is a common endocrine disorder of impaired glucose metabolism and is increasing globally due to changes in the lifestyle of individuals. It can be controlled or reversible by following a regular diet and proper exercises. Along with the diet and exercises, naturally available supplements are also helpful in controlling diabetes. There are many plant-based products which can be consumed in daily diet which act as nutraceuticals. The present case study was based on the natural supplementation with dried figs and sesame seeds. A 64-year-old man, known case of Type 2 diabetes consulted at nature cure hospital with chief complaint of uncontrolled fasting sugar and HbA1c since 8 years. A formulation is prepared using dried figs and sesame seeds and named the formulation 'Tennetti-tilla'. Along with regular medicines, 10 g of supplementation was advised for 90 days to the subject. After the study period it was observed that fasting glucose levels have reduced from 116 mg/dl to 96 mg/dl, post prandial from 147 mg/dl to 118 mg/dl and HbA1c from 7.1% to 6.0%.

**Keywords:** Dried figs, Tennetti-tilla, sesame seeds, nutraceuticals.

## INTRODUCTION

Diabetes mellitus is an endocrinal disorder, where the impairment of glucose metabolism occurs. The body cannot efficiently move glucose from blood into the cells due to lack of production of insulin (type 1) or body makes insulin, but the tissues donot respond to insulin mainly because the cells do not move glucose transporters to their membrane which is very essential for the glucose to enter into cells (insulin resistance) as in Type 2 diabetes. To control the blood glucose levels diabetic patients are on medications of different systems (Allopathy, Ayurveda, Homeopathy, Siddha, or Unani) which have their own limitations. Most of the conditions after long run usage of medications the blood sugar levels are not coming to normal levels. But proper diet and exercise will help to maintain blood glucose homeostasis along with the right medication. Apart from this, natural supplementation also helps to bring the glucose levels to normal status [1], [2]. In small quantities they may impact the metabolism of hormones. Adding dried fruits to daily diet along with regular medicines can reduce the risks of type 2 diabetes mellitus. Due to their high fibre, minimum fat, long shelf life, concentration of diverse micronutrients,[3] availability the rate of consumption has got popularized. Based on this, to know the impact of dried fruits in combination with the sesame seeds in case of type 2 diabetes was studied.

## CASE STUDY

The present case study was based on the natural supplementation with dried figs and sesame seeds. A 64-year-old man, known case of Type 2 diabetes consulted with chief complaint of uncontrolled fasting sugar and HbA1c since 8 years with regular medication. After taking his detailed history of diabetes, he was explained about the study and was enthusiastic to be a participant. A written consent was taken before giving supplement. His 24-hour dietary recall was recorded. His anthropometric data was height:164 cm, weight: 77kg, BMI:29.6 kg/$m^2$, and vital data BP: 118/72 mm hg, Pulse rate: 72/minute along with fasting blood glucose level is116 mg/dl, post prandial blood glucose is 147mg/dl and HbA1c is 7.1%.

The subject was supplemented with 10 grams of Tennetti-tilla which is made of dried figs and sesame seeds every day early in the morning along with his regular medication for a period of 90 days.

After the supplementation for 90 days the results were observed as below

**Table 1 : Effect of Tennetti-tilla**

| Before supplementation | After supplementation |
|---|---|
| Fasting blood glucose level=116 mg/dl | Fasting blood glucose level=96 mg/dl |
| Post prandial blood glucose=147 mg/dl | Post prandial blood glucose=118 mg/dl |
| Hemoglobin A1c= 7.1 % | Hemoglobin A1c= 6.0 % |

A remarkable difference was observed in HbA1c percentages after the supplementation of natural easily available products in present case study.

**DISCUSSION**

Figs are used from time immemorial by Indians (Siddha, Ayurvedic and Chinese) medicine systems. Figs are rich sources of vitamins, minerals, organic acids, amino acids, dietary fibers, carotenoids and polyphenolic compounds. The phenolic acids, flavones, flavonones, flavonoids, anthocyanidins are important polyphenols in figs [16]. Benzaldehyde, hexanal [8] and vitamin E, beta-amyrin, stigmasterol, campesterol, oleic acid, coumarin, saponins, terpenes, isoamylaurate and gama-tocopherols in adequate amounts [6] which help in antidiabetic and antiobesogenic activity of figs.

Sesame seeds are low-cost food source which provide protein, fat, vitamins and minerals if added in the diet.10% stearic acid, smaller amounts of linolenic acid, many polyunsaturated fatty acids and short chain peptides is the sesame seed nutritional composition. Nutritional composition of sesame seeds reveals that it has essential nutrients which are very beneficial to human body. Sesame seeds contain many antioxidants and bioactive compounds like phenolic, phytosterols, phytates and lignans [4] can help in oxidation of pancreatic cells as a result help in lowering blood glucose levels.

Photochemical help in decreasing post prandial hyperglycemia by inhibiting carbohydrates metabolizing enzymes.[3] Sesame seeds help in antidiabetic activity and may be because of the presence of fat soluble lignans like sesamin, sesamolin and gama-tocopherol.[2]

As Tennetti-tilla is made with natural products like dried figs and sesame seeds and this plant-based products contains many bioactive compounds like phytates, lignans, phytosterols, anthocyanins and flavonoids [16] which aid in ameliorating effect of Tennetti-tilla towards hyperglycemia. In hydrolysis of polysaccharides and disaccharides to simple sugars, the enzymes needed for this process are alpha-glucosidase and alpha-amylase and if the action of these enzymes is inhibited then carbohydrate digestion can be delayed so as a result glucose molecules are released slowly into the blood. Malic acid present in Ficus carica fruit extract acts as noncompetitive inhibitor of alpha-glucosidase enzyme thereby helping in reducing glucose levels in blood.[16]

**CONCLUSION**

A natural available ingredient supplementation can reduce the sugar levels of chronic, uncontrolled diabetes. More number of studies are needed to strengthen the experiment of Tennitti-tilla.

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