



# EVALUATION AND STANDARDIZATION OF LOW GLYCEMIC FOODS FOR TYPE2 DIABETES WITH HYPERTENSION SUBJECTS

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## ABSTRACT

Globally the number of people with diabetes is increasing due to population growth, aging, urbanization, and increasing prevalence of obesity and physical inactivity. Quantifying the prevalence of diabetes and the number of people affected by diabetes, now and in the future is important to allow rational planning to control and prevent. India has long passed the stage of a diabetes epidemic. The problem has now reached, in scientific language, "pandemic" proportions. To put it simply, it has crossed the dividing line in which it is a problem associated with individuals, no matter how large this number may be, and is now a very large public health problem, growing astronomically year after year. Low Glycemic index may reduce a person's risk of developing diabetes and heart disease. In people who already have chronic conditions, a low GI diet may reduce the risk of complications and prevent blood glucose spikes.

To begin with, corn silk, ladies finger, coriander are therapeutic effects, including anti-oxidant, hypolipidemic, anti-diabetic, anti-tumor, anti-hypertensive, anti-fatigue, anti-aging, anti-microbial, antifertility activity, hypertriglyceridemia and anti-proliferative activity on human cancer cell lines, lowering the risk of diabetes by stimulate the pancreas for secretion of insulin, prevention and control of diabetes and hypertension. Keeping this in view, the present study was designed to investigate the beneficial effect of the corn silk, coriander and ladies' finger on diabetes with hypertension. The study revealed that there is a significant change in the FBS, PPBS of subjects who were supplemented with masala mix (corn silk, coriander and ladies finger powder). Hence it can be concluded that adequate intake of cornsilk, coriander and ladies finger masala mix powder in the diet has impact on FBS, PPBS leaves there is a 1 percent level of significance.

**Key words:** Diabetes mellitus, Cornsilk, Coriander, Ladies finger, anti-oxidant, anti-diabetic, anti-hypertensive.

## I. INTRODUCTION

Diabetes is a chronic disease in which the body does not make or properly use insulin, a hormone that is needed to convert sugar, starches and other food into energy people with diabetes have increased blood glucose (sugar) levels due to a lack of insulin, insufficient insulin or resistance to insulin's effects. This may be due to many factors such as life style patterns, age, obesity, any infections, genetic factors and many others. Obesity is the predisposing factor for diabetes; this may be due to lifestyle changes physical inactivity or leading sedentary life style. The prevalence rate of diabetes in India is 8 percent. Prevalence is only 0.7 percent for non-obese, physically active, rural Indians. It reaches 11 percent for obese, sedentary, urban Indians (**Jared et al., 2011**).

Diabetes and hypertension frequently occur to gather. There is substantial overlap between diabetes and hypertension in etiology and disease mechanisms. Obesity, inflammation, oxidative stress, and insulin resistance are thought to be the common pathways.

Reflecting the substantial overlap in their etiology and disease mechanisms. Insulin resistance, a condition in which defects in the action of insulin are such that normal levels of insulin do not trigger the signal for glucose absorption, denotes an impaired response to insulin in skeletal muscle, liver, adipose, and cardiovascular tissue (**Bernard et al., 2012**).

It is reported that traditional medicines derived from medicinal plants are used by about 70% of the world's population. The World Health Organization (WHO) has listed 21,000 plants, which are used for medicinal purposes around the world. Traditional Indian medical science known as 'Ayurveda' uses drugs derived from medicinal plants, minerals, herbs for their therapeutic benefits (**Sinha Suhani et al., 2018**).

In the present study, corn silk was chosen since it is one of the most widely acclaimed remedies for the treatment of diabetes. Corn silk is known as a traditional Chinese herbal medicine which has been widely used to treat edema, cystitis, gout, nephritis, kidney stones, obesity, diabetes, high blood pressure, fatigue, and high cholesterol levels. As well as prostatitis and similar ailments. It also reported that corn silk possesses hypoglycemic, anti-tumor, antioxidant, anti-fatigue and anti-fungal properties. As mentioned, oxidative stress, as well as lipid metabolism disturbances play an important role in diabetes besides hyperglycemia, hence drugs with several properties would be much more effective in the treatment of diabetes (**Yan Zhang et al., 2015**).

Ladies finger performs hypoglycemic activity by slowing down the absorption of sugar through the intestinal tract. Hypoglycemic property of okra could probably be attributed to its high mucilaginous and fiber content. The major flavonoids of okra quercetin and quercetin 3-O-gentiobioside have blood glucose lowering effect. Due to above listed properties it is recommended for diabetic patients (**Sinha Suhani et al., 2018**).

In the Indian traditional medicine, coriander is used for recommended in urethritis, cystitis, urinary tract infection, urticaria, rash, burns, sore throat, vomiting, indigestion, nosebleed, cough, allergies, hay fever, dizziness and amoebic dysentery. All parts of the plant are edible, but the fresh leaves and the dried seeds are the most common parts used in cooking. Pharmacological studies have demonstrated the Hypoglycemic, Hypolipidemic, Antimutagenic, Antihypertensive, Antioxidant, Antimicrobial and postcoital antifertility activity of Coriander sativum (**Nimish et al., 2011**).

Keep in this view the present study was conducted to standardization of low glycemic foods for type 2 diabetes with hypertension subjects.

## II. MATERIALS AND METHODS

### 2.1 SELECTION OF SAMPLE

The type 2 diabetic subjects were selected from the outpatient list who were regularly attending the clinic for their follow-up. The study was designed with 20 adults in the selected age group of 30-70 Years, who were willing to participate in the study with their blood test (GTT). Based on the blood glucose levels and the subject keen interest the adults were selected for the further intervention programme.

### 2.2 SIZE OF SAMPLE

For basis study (n=20) subjects were selected. The 20 subjects were categorized into two groups classified as diabetic group and non-diabetic group. 10 subjects were diabetic group and 10 subjects were non diabetic group based on their blood sugar levels (90-110 mg/dl) and post prandial blood sugar levels = 110-140 mg/dl. The following 2 groups were used for intervention to the Diabetic group (10) and Non diabetic group (10). In this study prepared a plain chapathi and supplemented for both the groups and tested GTT for 1 day. On 2<sup>nd</sup> day Supplemented with Masala Mixed Chapathi for both the groups and tested GTT.

### 2.3 PREPARATION OF THE PRODUCT

The fresh Corn Silk (1000g) was collected from Prathuru village in Mahanadu region, Guntur Dist. They were washed thoroughly in cold water and blanched for 5 minutes. The Corn Silk was then dried in a sun light for 5 days. The dried Corn Silk (which results of 200g) were grind into fine powder. The fresh Coriander leaves (1000g) and ladies finger (1kgs) was collected from Tirupati, Chittoor Dist. They were washed thoroughly in cold water and blanched for 5 minutes. The coriander was then dried in a sun light for 3 days. And ladies' finger was then dried in sun light for 10 days. The dried coriander (which results of 90g), and ladies' finger (which results of 90g) were grind into fine powder. Flax seeds(100g), Sesame seeds(100g), pepper(30g), tamarind (30g) and jeera (30g) are taken and well roasted, then grind into fine powder and preserved in air tight glass container.

## 2.4 SUPPLEMENTATION OF THE PRODUCT FOR 2 MONTHS

The product was supplemented for 1 day to diabetic and non-diabetic subjects in the current study. And the subjects were informed to use this product as a part of their diet once a day either as breakfast or in the lunch according to their convenience. A total 35 grams of masala mix powder was supplemented and the subjects.

## 2.5 PRE AND POST BIO CHEMICAL ANALYSIS

The pre and post biochemical analysis was carried for the subjects before and after supplementation.

### III. RESULTS & DISCUSSION

**Table: 1 The percentage distribution of the blood sugar levels for diabetic subjects before and after food.**

Type of group	Gender		Fasting blood sugar			Post prandial blood sugar		
			70-110 mg/dl	110-125 mg/dl	Above 125 mg/dl	80-140 mg/dl	140-180 mg/dl	Above 180 mg/dl
Diabetic	Male	BF	0	0	5(50)	0	0	5(50)
		AF	0	1(10)	4(40)	2(20)	3(30)	0
	Female	BF	3(30)	0	2(20)	0	1(10)	4(40)
		AF	0	5(50)	0	0	5(50)	0

**Note: Fig in ( ) denotes percentage, BF = Before food AF = After food**

From the **table 1** is evident that majority of male diabetic subjects fasting blood sugar levels are higher at the above 125mg/dl (50%). And post prandial blood sugar levels above 180mg/dl (50%) before giving food (masala mix powder). After food the blood sugar levels are decreased in diabetic male subjects at fasting above 125mg/dl observed (40%) and (10%) seen in 110-125mg/dl. And post prandial blood sugar levels observed in 140-180mg/dl is (30%) and 80-140mg/dl is (20%).

That table in table 1 is evident that majority of female diabetic subjects fasting blood sugar levels higher in at the range of 70-110mg/dl is (30%) and above 125mg/dl (20%) before food (masala mix powder). After adding the food in their menu, the blood sugar levels were decreased at fasting blood sugar levels 50 percent at the range of 140-180mg/dl in post prandial blood sugar.

**Table: 2 The percentage distribution of the blood sugar levels for non-diabetic subjects before and after food.**

Type of group	Gender		Fasting blood sugar			Post prandial blood sugar		
			70-110 mg/dl	110-125 mg/dl	Above 125 mg/dl	80-140 mg/dl	140-180 mg/dl	Above 180 mg/dl
Non diabetic	Male	BF	5(50)	0	0	5(50)	0	0
		AF	5(50)	0	0	5(50)	0	0
	Female	BF	5(50)	0	0	5(50)	0	0
		AF	5(50)	0	0	5(50)	0	0

**Note: Fig in ( ) denotes percentage, BF = Before food AF = After food**

**Table 2** shows there is no difference between fasting and post prandial blood sugar levels before and after adding the food in non-diabetic female (50%) and male (50%) subjects.

**Table: 3**The comparison of mean the glyceimic index of diabetic and non-diabetic subjects.

S. No	Type of group	Gender	Glyceimic index		
			Mean	$\pm$ SD	t-value
1	Diabetic	Male n=5	72.869	$\pm$ 15.948	0.079 NS
		Female n=5	82.877	$\pm$ 14.097	
2	Non diabetic	Male n=5	67.043	$\pm$ 21.531	0.282 NS
		Female n=5	56.447	$\pm$ 20.997	

**Note : NS = Not significant**

**The table 3** is shows the glyceimic index of mean and  $\pm$ SD values compared in both diabetic female (82.877,  $\pm$ 14.097) and male diabetic subjects (72.869,  $\pm$ 15.948). The glyceimic index of mean and  $\pm$ SD values compared in both non-diabetic female (56.447,  $\pm$ 20.997) and male diabetic subjects (67.043,  $\pm$ 21.531). This values of evident of there is not significant in t-values in diabetic (0.079), non-diabetic (0.282). There is no significant after providing masala mix powder to diabetic and non-diabetic males and female subjects.

#### IV. CONCLUSION

It can be concluded from the study that there is an effectiveness of Cornsilk, ladies finger and coriander masala mix powder for NIDDM diabetes subjects. It can be said that this revelation has been a thorough influx of relief for diabetes. The results indicated a not significant reduction in glucose tolerances test of the subjects.

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