



## Miraculous plant for correcting high blood glucose

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### Abstract

Type 2 diabetes used to be known as adult-onset diabetes, but today more children are being diagnosed with the disorder, probably due to the rise in childhood obesity. There's no cure for type 2 diabetes, but losing weight, eating well and exercising can help manage the disease. If diet and exercise aren't enough to manage your blood sugar well, you may also need diabetes medications or insulin therapy. Type 2 diabetes is the most common form of diabetes (90% of cases). It usually occurs in adulthood, in individuals 40 years and older. Unfortunately, for several years, it has begun appearing in younger and younger age groups. In some populations at risk, it may even occur in childhood. Some people with type 2 diabetes have pancreatic cells that do not produce enough insulin. In others, the insulin they produce does not do its job properly, creating what is known as insulin resistance. In both cases, the result is an increase in blood glucose levels, since the body is not able to effectively use the glucose as an energy source. Metformin is oral antidiabetic drug having lesser morbid effects as compared to other oral antidiabetic agents. We have compared hypoglycemic potential of herbal hypoglycemic agent Figs or INJEER with Metformin. It was single blind correlational research conducted at Jinnah Hospital Lahore-Pakistan from April to August 2018. Fifty diabetic type-II patients of were selected for research. Approved and explained consent was taken by all patients. They were divided in two groups, 25 patients in each group. Group-I patients were advised to take 250 mg Metformin thrice daily for two months. Group-II patients were advised to take 10 grams of Injeer (Figs) in three divided doses for two months. Their base line fasting blood glucose level was taken and kept in record. They were advised to visit the OPD of the hospital fortnightly. They were also advised to check their fasting plasma glucose level daily at the morning by using Glucometer (provided by Acon Pharmaceuticals Ltd). After two months when results were compiled and statistically analyzed, it was observed that Metformin decreased blood sugar level 27.6 % and Figs decreased 13.5 %. It was concluded from the study that Figs can decrease blood glucose level significantly, but when compared to Metformin, this change is about half fraction of the Metformin.

**Keywords:** high serum glucose, lipids, mortality CAD, CCF, hyperlipidemia

### Introduction

Type 2 diabetes develops when the body becomes resistant to insulin or when the pancreas is unable to produce enough insulin. Exactly why this happens is unknown, although genetics and environmental factors, such as being overweight and inactive, seem to be contributing factors. Insulin is a hormone produced by the body that moves sugar from the bloodstream into cells to use as fuel. Type 2 diabetes occurs when the body isn't able to produce enough insulin or cells develop an insulin resistance. Type 2 diabetes can be the result of a combination of genetics, poor diet, lack of exercise, or obesity. Patients with high blood sugar will typically experience polyuria (frequent urination), they will become increasingly thirsty (polydipsia) and hungry (polyphagia). Normally, body breaks down the sugars and carbohydrates eat into a special sugar called glucose. Glucose fuels the cells in body. But the cells need insulin, a hormone, in bloodstream in order to take in the glucose and use it for energy. With diabetes mellitus, either body doesn't make enough insulin, it can't use the insulin it does produce, or a combination of both [2]. Since the cells can't take in the glucose, it builds up

in blood. High levels of blood glucose can damage the tiny blood vessels in kidneys, heart, eyes, or nervous system. That's why diabetes -- especially if left untreated, can eventually cause heart disease, stroke, kidney disease, blindness, and nerve damage to nerves in the feet [30]. Currently, six classes of oral antidiabetic drugs (OADs) are available: biguanides (e.g., metformin), sulfonylureas (e.g., glimepiride), meglitinides (e.g., repaglinide), thiazolidinediones (e.g., pioglitazone), dipeptidyl peptidase IV inhibitors (e.g., sitagliptin), and  $\alpha$ -glucosidase inhibitors (e.g., acarbose) [4]. Metformin marketed under the trade name Glucophage among others, is the first-line medication for the treatment of type 2 diabetes. This is particularly true in people who are overweight. It is also used in the treatment of polycystic ovary syndrome. Limited evidence suggests metformin may prevent the cardiovascular disease and cancer complications of diabetes. It is not associated with weight gain. It is taken by mouth [5]. Metformin is generally well tolerated. Common side effects include diarrhea, nausea, and abdominal pain. It has a low risk of developing low blood sugar. High blood lactic acid levels is a concern if prescribed inappropriately and in

overdose. It should not be used in those with liver disease or kidney problems. While there is no clear harm if used during pregnancy insulin is generally preferred for gestational diabetes. Metformin is in the biguanide class. It works by decreasing glucose production by the liver and increasing glucose use by body tissues [6-9]. Fig is a tree. The fruit is commonly eaten. The fruit and leaves are used to make medicine [10]. Raw figs are a good source (14% of the Daily Value, DV) of dietary fiber per 100 gram serving (74 calories), but otherwise do not supply essential nutrients in significant content. In a 100gram serving providing 229 calories, dried figs are a rich source (> 20% DV) of dietary fiber and the essential mineral, manganese (26% DV), while several other dietary minerals are in moderate-to-low content [11]. Figs contain diverse phytochemicals, including polyphenols such as gallic acid, chlorogenic acid, syringic acid, (+)-catechin, (-)-epicatechin and rutin. Fig color may vary between cultivars due to various concentrations of anthocyanins, with cyanidin-3-O-rutinoside having particularly high content [12, 13].

### Patients & method

Design of research work was correlational, and was conducted at Jinnah Hospital, Lahore from April to August 2018. Fifty diabetic patients (Diabetes Mellitus type-II) were selected from Jinnah hospital to conduct research study. Inclusion criteria was age limit from 25 to 70 years of both gender, male and female whose hyperglycemia was

controlled and moderate in state. We excluded those diabetic patients whose hyperglycemia was uncontrolled, unstable, fragile due to use of allopathic or herbal hypoglycemic agents. Patients were divided in two groups. Group-I (25 diabetic patients) was advised to take 250 mg of Tablet Glucophage 250 mg (Metformin) half an hour before taking meal, thrice daily for two months. Group-II patients (25 diabetic patients) were advised to take Injeer (Figs) 10 grams daily in three divided doses half an hour after each meal for two months. Their baseline fasting glucose level was determined by Glucometer (On Call Extra made by ACON Lab 1190059) at start of research work. They were advised to check and keep in record their fasting blood glucose level every day early in the morning. They were advised to take their normal meal without any supplement or high glucose-contained baked or high glucose containing natural fruits. They were advised to come at hospital for follow up or any query regarding drug compliance. Data were expressed as the mean  $\pm$  SD and "t" test was applied to determine statistical significance as the difference. A probability value of <0.01 was considered as significant and P<0.001 was considered as highly significant.

### Results

Results of treatment with two different drugs on fasting blood glucose of DM-II patients are shown in following table, which are self-explanatory.

**Table 1:** Explaining before and after treatment values, percentage change and statistical significance of diabetic patients with two different drugs

| Drug group               | At day-0          | At day-60         | change | % change | p-value |
|--------------------------|-------------------|-------------------|--------|----------|---------|
| Group-I (Metformin) n=23 | 230.04 $\pm$ 1.99 | 166.66 $\pm$ 2.05 | 63.4   | 27.6     | <0.001  |
| Group-II (Figs) n=25     | 219.22 $\pm$ 1.67 | 189.67 $\pm$ 1.04 | 29.5   | 13.5     | <0.01   |

**Key:** All values were measured in mg/dl, Dose of Metformin was 250 mg thrice daily, dose of Figs was 10 grams in three divided doses, n= sample size, p-value <0.01 was considered as significant and p-value <0.001 was considered as highly significant change.

### Discussion

Chronic diabetes conditions include type 1 diabetes and type 2 diabetes. Potentially reversible diabetes conditions include prediabetes — when your blood sugar levels are higher than normal, but not high enough to be classified as diabetes — and gestational diabetes, which occurs during pregnancy but may resolve after the baby is delivered. Allopathic medications are just for good survival of the patients victimized. These drugs have adverse effects which can lead to less compliance of patients. Now a days herbal medications are going to replace allopathic drugs due to their ethnic related doctrine and having lesser adverse effects. In our research Metformin decreased fasting blood glucose 63.4 mg/dl in two months therapy which is equal to 27.6 % decrease. Biostatistically this change in mean values are highly significant which match with results of study conducted by Hubbard JK *et al.* [14] who proved almost same effects of Metformin on fasting blood sugar levels in 103 diabetic patients suffering from Diabetes Mellitus type-II. Dunn CJ *et al.* [15] described that Metformin interrupt carbohydrates absorption from gastrointestinal tract. Our results are in contrast with results of study conducted by Spiller HA *et al.* [16] who observed and proved only 24.8 mg/dl reduction in 22 diabetic male patients when Metformin was used at dose of 250 mg twice daily for three weeks. This contrast in results may be due to less

concentration of drug used. Hundal RS *et al.* [17] agrees with already accepted theory of Metformin's hypoglycemic mechanism that inhibition of hepatic gluconeogenesis is main cause for blood glucose level reduction. Triggle CR *et al.* [18] labelled Metformin drug as first choice hypoglycemic agent in type-II diabetic patients. In our research results Figs or Injeer decreased fasting blood sugar about 29.5 mg/dl in two months therapy in 25 diabetic patients of Type-II which is statistically significant decrease in the parameter. These results match with results of study conducted by Mawa S *et al.* [19] who proved that about 30.87 mg/dl of blood glucose may be decreased when Figs are used for three months with regular intake of this fruit with each meal i.e. thrice daily. C Perez *et al.* [20] proved almost same changes in fasting blood glucose in 117 diabetic patients suffering from Type-II DM. Perez C *et al.* [21] wrote that these fruits can lower fasting sugar level even more than this reduction proved, if used in enough amount and in research-controlled environment. Our results do not match with results of research work conducted by Serracarla A *et al.* [22] who proved very small amount of blood glucose reduction in 12 patients suffering from DM type-II, even they used 500 mg of Metformin thrice daily for one month. Contrast in these results are or may be due to lesser exposure of drug and small sample size. Lyme WE *et al.* [23] warned in their research work's conclusion that Metformin can cause morbid effects if given concurrently

with Insulin. He has encouraged to use Metformin with Figs without any fear of morbid hypoglycemia.

### Conclusion

We concluded from this research that hypoglycemic agents of herb origin i.e. Figs may be good antidiabetic agent but these agents have half fraction of hypoglycemic effects when compared with allopathic drug Metformin.

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### Conflict of interest

No conflict of interest regarding this work

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