

**PRECLUSION & CONTROLLING OF DIABETES MELLITUS TYPE-II(ZAYĀBĪŪS
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ABSTRACT

Health is the key factor for the progress both at individual and community level, so the disease should be of the great concern at both the levels. Diabetes being the most known disease of this era and India is the diabetic capital of the world. Despite availability of various advanced form of management incidence of diabetes is still increasing day by day. One of its most serious complications is diabetic foot which results in well-known non-healing ulcer. Studies have shown the fact that the conventional management of the diabetes does not have a justifiable answer to decrease its burden from society. Therefore, researchers are looking for an alternative approach to tackle and cease the ever-increasing load of diabetes. Unani System of Medicine is one of the oldest and time proven methods to manage this kind of situation. It has entirely different and comprehensible concept of diabetes. According to Greek Philosopher the diabetes mellitus is the result of disturbance in quantity as well as quality of *Akhlāt* (Humors) and *Mizaj* (Temperament) which leads to decrease in *Hararat-e-Gariziya*. This concept clearly describes diabetes, its pathogenesis, complications and holistic approach towards its management. Non-healing ulcer, in conventional medicine, is entirely manageable in Unani medicine. Hence the objective of this comprehensive review is to explain the Unani Approach in the management of *Ziabetus Shakri* (Diabetes Mellitus) and its complications.

KEYWORD: Diabetes Type II. Etiologies, Prevention and managements, Herbal drugs.**I. INTRODUCTION OF DIABETES MELLITUS
TYPE-II**

According to World Health Organization, chronic lifestyle diseases, also known as non-communicable diseases, are not passed from person to person.^[1,3] Diabetes mellitus is rapidly becoming one of the most common non-communicable disease.^[2] It is a metabolic disorder characterized by hyperglycaemia, glycosuria and its mainly due to lack of insulin secretion from beta cells of Pancreas and desensitization of insulin receptors for insulin.^[8] The word diabetes is derived from the Greek word “Siphon” meaning passing through or to run through or siphon, which is characterized by polydipsia, polyurea, Glucoseurea, Polydipsia, gradual loss of body weight, etc. *Ziabetus* is the nomenclature used for diabetes, in general, and *Ziabetus Shakri* for diabetes mellitus, in particular. Unani physicians considered that *Ziabetus* is a disease of kidney. Arabian physicians described *Ziabetus* by some other names also such as *Moattasha*, *Atsha*, *Zalaqul kulliya*, *Dolab*, *Dawwarah*,

Barkar, Barkarya, and Qaramees.

II. Prevalence of Diabetes Mellitus Type-II

According to statistical from the International Diabetes Federation; India has more diabetics than any other nation of the world. Current estimates peg the number of diabetics in the country at about 62 million an increase of over 10 million from 2011 when estimates suggested that about 50.8 million people in the country were suffering from the disease. By the year 2030, over 100 million people in India are likely to suffer from diabetes, say researchers.^[37] According to international Diabetes federation report diabetes kills one person every seven seconds and kills about 3.2 million every year worldwide.^[17] The prevalence of diabetes for all age groups worldwide was approximated to be 2.8% in 2000 and 4.4% in 2030. The entire number of people with diabetes is projected to rise from 171 million in 2000 to 366 million in 2030.^[38]

III. Historical Background of Diabetes Mellitus

In Unani classical text diabetes is described by renowned unani scholars like Zakaria Al Razi, Ali Ibn abbas majoosi, Ibn sina, Ismail jurjani, Ibn zuhar, Ibn Hubal Baghdadi with various names such as Ziabetes, Moattasha, Barkarya Qamamees etc.^[18]

Ibn Sina/Avicenna (980-1037) who termed the disease as Dulab, Zalqul Kulliya terms that Galenus/Jalinus/Galen. Ibn Sina was the first who wrote that the differentiating features of diabetes associated with emaciation form other causes polyuria.

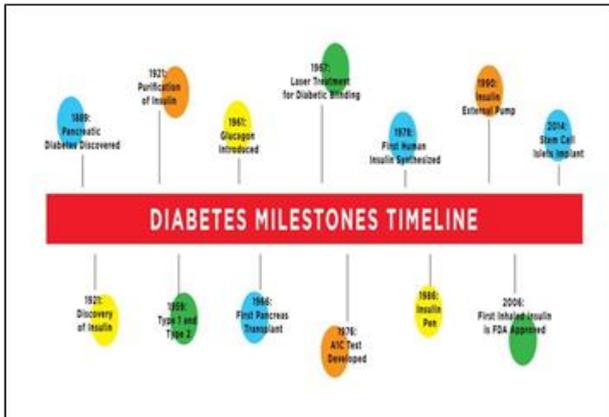


Fig. 1: History of Diabetes Mellitus

- Clinical features similar to diabetes mellitus were described 3000 years ago by ancient Egyptians. They were the first to write papers about this disease, which is proved of Thebes in 1862, written by Georg Eberes about 1550 BC.
- Hippocrates (460 BC) mentioned a disease with excessive urinary flow and waste out of the body.
- The first cognized clinical description of diabetes appears to have been made by Aulus Cornelius Celsus (30 BC-50AD), but it was Areteus of Cappadocia, who plied a detailed and accurate account and introduced the name “diabetes” from the Greek word for “siphon”.
- Galen (131-201 AD) defined diabetes as Diarrhea Urinosa (diarrhea of urine) and dipsakos (thirsty disease). He described it as a disease specific to kidneys because of weakness in their retentive ability.
- The Chinese (Chang chung-Ching in 229 AD) and Japanese (Li Hsuan) literature explained a disease with sweet urine, which attracted dogs and insects.
- During the 5th and 6th centuries, the sweet taste of urine in polyuric patients was also described in the Sanskrit (Indian) literature by Susruta, Charaka, and Vaghbata, and the disease was named Madhumeha.

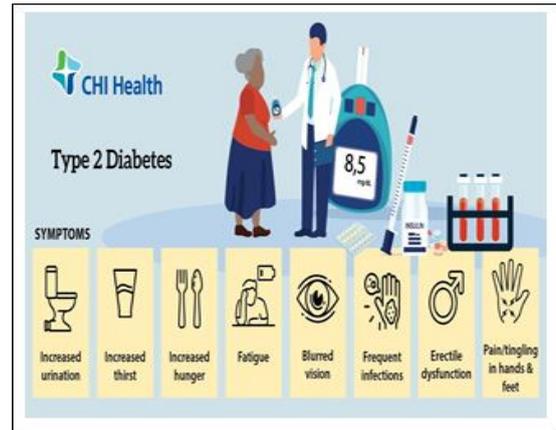


Fig. 2: Symptoms of Diabetes Mellitus Type II.

IV. Symptom of Diabetes Mellitus Type II

Symptoms of type 2 diabetes often develop slowly. In fact, you can be living with type 2 diabetes for years and not know it. When symptoms are present, they may include.

- Polyphagia
- Polyuarea
- Polydipsia
- In-spite of Good diet, weight loss.
- Fatigue.
- Blurred vision.
- Slow-healing sores.
- Frequent infections.
- Numbness or tingling in the hands or feet.
- Areas of darkened skin, usually in the armpits and neck.

V. Causes of Diabetes Mellitus Type-II

Type 2 diabetes is mainly the result of two problems.

- Cells in muscle, fat and the liver become resistant to insulin As a result, the cells don't take in enough sugar.
- The pancreas can't make enough insulin to keep blood sugar levels within a healthy range. Exactly why this happens is not known. Being overweight and inactive are key contributing factors.

Insulin is a hormone that comes from the pancreas a gland located behind and below the stomach. Insulin controls how the body uses sugar in the following ways.

- Sugar in the bloodstream triggers the pancreas to release insulin.
- Insulin circulates in the bloodstream, enabling sugar to enter the cells.
- The amount of sugar in the bloodstream drops.

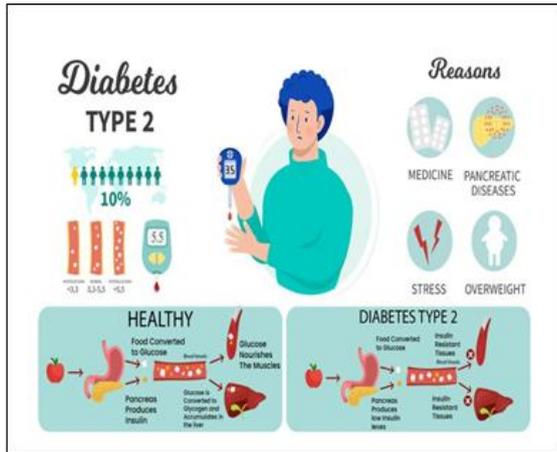


Fig. 3: Diabetes Mellitus Type II A Common Disorder in male and female.

In response to this drop, the pancreas releases less insulin.

Glucose a sugar is a main source of energy for the cells that make up muscles and other tissues. The use and regulation of glucose includes the following.

- Glucose comes from two major sources: food and the liver.
- Glucose is absorbed into the bloodstream, where it enters cells with the help of insulin.
- The liver stores and makes glucose.
- When glucose levels are low, the liver breaks down stored glycogen into glucose to keep the body's glucose level within a healthy range.

In type 2 diabetes, this process doesn't work well. Instead of moving into the cells, sugar builds up in the blood. As blood sugar levels rise, the pancreas releases more insulin. Eventually the cells in the pancreas that make insulin become damaged and can't make enough insulin to meet the body's needs.

VI. Ziabetus in Unani System of Medicine

Ziabetus is mentioned in most of the Unani literature like Al Qanoon, Al Hawi, Kamil Sana'ah etc.^[9] In unaniliterature it is attributed to be the disease of kidney.^[7] According to unani medicine, *Ziabetus shakri* is a disease in which the consumed water is passed out through the kidney immediately after intake by the patient. It is like the *Zalaqul Meda wa Ama* (irritable bowel syndrome) in which the food passes rapidly through the stomach and intestine without proper digestion. The Unani philosophy of disease causation is based on *Mizaj* (temperament) and *Saakht* (structure) deviation.^[39]

Allama Hakeem Kabeeruddin classified *Ziabetus* into two types

- ❖ *Ziabetus Haar* (Shakari)
- ❖ *Ziabetus Barid* (Sada)

On the basis of presence of sugar in urine *Ziabetus* is divided into two types

- ❖ *Ziabetus shakari* (Diabetes Mellitus)
- ❖ *Ziabetus sada* (Diabetes Insipidus)

VII. Etio-pathogenesis of Diabetes Mellitus Type-II

Unani physicians Majoosi, Ibn Sina (980-1037AD) and Samarqandi (1222AD) described some underline etio pathogenesis in detail. It was supposed that the disease is related to kidney. The important etiological factors mentioned in USM are the following.

A. Zofe Gurda (Weakness of Kidneys)

Water cannot be retained properly due to the weakness of kidneys and their *Quwate masika* (retentive faculty), and kidneys are unable to metabolize the water that is coming from liver.

B. Ittesae Gurda wa Majrae Bole (Dilatation of Kidneys and Tubules)

Water cannot be retained for long/required time due to dilatation of *Gurda wa Majrae Baul* (Dilatation of Kidneys and Tubules), so it is passed out rapidly (polyuria).

C. Sue Mizaj Haar Gurda (Hot derangement in the temperament of kidneys)

Kidneys absorb water in an excess amount from circulation due to excessive hotness or derangement in temperament, so they cannot retain much amount of fluid and pass in the form of urine frequently (polyuria) and the patient drinks water frequently (polydipsia) to overcome his thirst.

The nutritive capacity of all the organ and body as a whole performs three functions, such as *Tehseel* (acceptance), *Ilsaaq* (adherence), and *Tashbia* (assimilation). These three functions are served by four other capacities—*Masika* (retentive), *Dafia'* (eliminative), *Jaziba* (absorptive), and *Hazima* (digestive). And these functions are mediated by four *Kaifiyate* (quality) of *Mizaj*, i.e., *Hararat*, *Burudat*, *Ratubat*, and *Yabusat*. So, deviation in these *mizaji Kaifiyat* (temperamental quality) by any cause hampers the function of *Quwwate Ghazia* and thereby results into *Badal ma yatahallal* (assimilation), which is essential for the maintenance and growth of the body and its members.

VIII. Usool-E-ILAJ (Line of Management)

- According to Hippocrate it is a disease of *Sue Mizaj Haar Yabis* so use of *Barid Ratab* and *Muqawwi-e-Gurda Advia wa Aghzia* are beneficial like *Ma'al-Sha'ir*. According to Jalinoos use of alkalizer and *Tabreed kulliya* is the sole of treatment. In *Makool wa Mashroob* use *Qabizat wa Hamizat* foods.^[8]
- Weight reduction with calorie restricted diets and increased physical activity are the first line therapy of DM.^[4]

IX. Modern Concept of Diabetes Mellitus Type-II

Diabetes Mellitus refers to a group of common metabolic disorders that share the phenotype of hyperglycaemia. Type 2 DM is a non-autoimmune, complex, heterogeneous and polygenic metabolic disease condition in which the body fails to produce enough insulin, characterized by abnormal glucose homeostasis.^[5] It is classified on the basis of pathogenic process that leads to hyperglycaemia.

- ❖ Type 1DM or insulin dependent DM (IDDM) or Juvenile onset DM³. (Due to Sue Mizaj-Har Yabis Khilqi / hot and dry in temperament).^[40]
- ❖ Type 2 DM or non-insulin dependent DM (NIDDM) or Adult Onset DM³. (Due to Sue Mizaj- Barid Ratab /Excess of coldness and wet).^[10,40]

X. Diagnosis of Diabetes Mellitus Type-II

CRITERIA FOR DIAGNOSIS OF DIABETES MELLITUS

The current American Diabetes Association criteria for the diagnosis of diabetes mellitus are as follow.

- Classic Symptoms of diabetes (polyurea, polydipsia and unexplained weight loss) plus random blood glucose concentration ≥ 200 mg/dl (≥ 11.1 m mol/L);
- Fasting (≥ 8 hour) plasma glucose conc mg/dL (≥ 7.0 m mol/L);
- Two-hour post load plasma glucose concentration ≥ 200 mg/dL (11.1 m mol/L) during a 75 gm oral glucose tolerance test.

A. Random blood sugar test. Blood sugar values are expressed in milligrams of sugar per deciliter (mg/dL) or milli moles of sugar per liter (m mol / L) of blood. Regardless of when you last ate, a level of 200 mg/dL (11.1 m mol / L) or higher suggests diabetes, especially if you also have symptoms of diabetes, such as frequent urination and extreme thirst.

B. Fasting blood sugar test. A blood sample is taken after you haven't eaten overnight. Results are interpreted as follows.

- Less than 100 mg/dL (5.6 m mol / L) is considered healthy.
- 100 to 125 mg/dL (5.6 to 6.9 m mol / L) is diagnosed as pre-diabetes.
- 126 mg/dL (7 mmol/ L) or higher on two separate tests is diagnosed as diabetes.

C. Oral glucose tolerance test. This test is less commonly used than the others, except during pregnancy. You'll need to not eat for a certain amount of time and then drink a sugary liquid at your health care provider's office. Blood sugar levels then are tested periodically for two hours. Results are interpreted as follows.

- Less than 140 mg/dL (7.8 m mol /L) after two hours is considered healthy.
- 140 to 199 mg/dL (7.8 m mol /L and 11.0 m mol / L) is diagnosed as pre-diabetes.

- 200 mg/d L (11.1 m mol /L) or higher after two hours suggests diabetes.

D. Screening. The American Diabetes Association recommends routine screening with diagnostic tests for type 2 diabetes in all adults age 35 or older and in the following groups.

- People younger than 35 who are overweight or obese and have one or more risk factors associated with diabetes.
- Women who have had gestational diabetes.
- People who have been diagnosed with pre-diabetes.
- Children who are overweight or obese and who have a family history of type 2 diabetes or other risk factors.

If you're diagnosed with diabetes, your health care provider may do other tests to distinguish between type 1 and type 2 diabetes because the two conditions often require different treatments. Your health care provider will test A1C levels at least two times a year and when there are any changes in treatment. Target A1C goals vary depending on age and other factors. For most people, the American Diabetes Association recommends an A1C level below 7%. You also receive tests to screen for complications of diabetes and other medical conditions.

Table no 1:- Diagnostic Categories; Impaired Fasting Glucose Impaired Glucose Tolerance And Diabetes Mellitus.

2 Hour (75- gm) OGTT Result			
Fasting P. Glucose Level	<140 mg/dl	140- 199 mg/dl	200 mg/dl
<100 mg/dl	Normal	IGT	OM
100-125 mg/dl	IFG	IGF and IGT	DM
126 mg/dl	DM	DM	DM

XI. Treatment of Non Insulin Dependent Diabetes Mellitus Type-II

Not everyone with type 2 diabetes uses insulin. Research has increasingly shown that a healthful diet is crucial for preventing and managing type 2 diabetes. Ongoing research is investigating the most appropriate diet to follow and the role of other lifestyle factors, such as cigarette smoking, stress, and sleep. A number of non-insulin therapies for diabetes emerged during the 20th century. People can take each of these by mouth. They include.

A. Metformin: The discovery of metformin stemmed from the use of *Galega officinalis* as a medieval treatment for diabetes. Metformin is a biguanide. Scientists developed several biguanides during the 19th century, but they either had severe side effects or did not reach the market. Metformin became available in the United States in 1995.

B. Sulfonylureas: These contain a type of chemical called sulfonamides, some of which can reduce blood sugar. Carbutamide became available in 1955, and since then, other sulfonylureas have appeared.

- C. Pramlintide:** Doctors sometimes prescribe this drug for people with type 1 diabetes to slow the rate at which the stomach empties, reduce glucagon secretions from the pancreas, and help a person feel full. In this way, it can help with weight loss and reduce the amount of insulin that a person needs.
- D. Sodium-glucose cotransporter 2 (SGLT2) inhibitors:** These reduce blood glucose independently of insulin by decreasing the amount of glucose that the body absorbs. They can also help lower blood pressure and body weight. Current guidelines recommend that doctors prescribe them for people with type 2 diabetes who have a risk of atherosclerotic cardiovascular disease. The Food and Drug Administration (FDA) have not approved them for the treatment of type 1 diabetes.
- E. Glucagon-like peptide 1 (GLP-1) receptor inhibitors:** These can reduce glucose levels in the body and lower the risk of cardiovascular disease in people with type 2 diabetes who are at high risk of a heart attack or stroke. The FDA has not approved them for treating type 1 diabetes. People can take these medications by mouth or in the form of an injection.

Since 1996, a range of oral medications have emerged that can treat diabetes and its complications. Newer medications include both oral and injectable medicines.

XII. Risk factors of Diabetes Mellitus Type-II

Factors that may increase the risk of type 2 diabetes include.

- **Weight.** Being overweight or obese is a main risk.
- **Fat distribution.** Storing fat mainly in the abdomen rather than the hips and thighs indicates a greater risk. The risk of type 2 diabetes is higher in men with a waist circumference above 40 inches (101.6 centimeters) and in women with a waist measurement above 35 inches (88.9 centimeters).
- **Inactivity.** The less active a person is, the greater the risk. Physical activity helps control weight, uses up glucose as energy and makes cells more sensitive to insulin.
- **Family history.** An individual's risk of type 2 diabetes increases if a parent or sibling has type 2 diabetes.
- **Race and ethnicity.** Although it's unclear why, people of certain races and ethnicities including Black, Hispanic, Native American and Asian people, and Pacific Islanders are more likely to develop type 2 diabetes than white people are.
- **Blood lipid levels.** An increased risk is associated with low levels of high-density lipoprotein (HDL) cholesterol the "good" cholesterol and high levels of triglycerides.
- **Age.** The risk of type 2 diabetes increases with age, especially after age 35.
- **Prediabetes.** Prediabetes is a condition in which the blood sugar level is higher than normal, but not high

enough to be classified as diabetes. Left untreated, prediabetes often progresses to type 2 diabetes.

- **Pregnancy-related risks.** The risk of developing type 2 diabetes is higher in people who had gestational diabetes when they were pregnant and in those who gave birth to a baby weighing more than 9 pounds (4 kilograms).
- **Polycystic ovary syndrome.** Having polycystic ovary syndrome — a condition characterized by irregular menstrual periods, excess hair growth and obesity — increases the risk of diabetes.

XIII. Complications of Diabetes Mellitus Type-II

Type 2 diabetes affects many major organs, including the heart, blood vessels, nerves, eyes and kidneys. Also, factors that increase the risk of diabetes are risk factors for other serious diseases. Managing diabetes and controlling blood sugar can lower the risk for these complications and other medical conditions, including.

- **Heart and blood vessel disease.** Diabetes is associated with an increased risk of heart disease, stroke, high blood pressure and narrowing of blood vessels, a condition called atherosclerosis.
- **Nerve damage in limbs.** This condition is called neuropathy. High blood sugar over time can damage or destroy nerves. That may result in tingling, numbness, burning, pain or eventual loss of feeling that usually begins at the tips of the toes or fingers and gradually spreads upward.

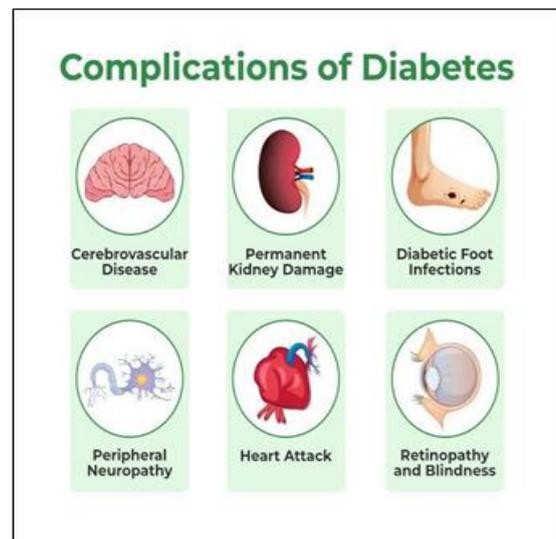


Fig. 4: Complication of Diabetes Mellitus Type II.

- **Diabetes Nephropathy.** Diabetes may lead to chronic kidney disease or end-stage kidney disease that can't be reversed. That may require dialysis or a kidney transplant.
- **Ophthalmic complication.** Diabetes increases the risk of serious eye diseases, such as cataracts and glaucoma, and may damage the blood vessels of the retina, potentially leading to blindness.
- **Skin conditions.** Diabetes may raise the risk of some skin problems, including bacterial and fungal

infections.

- **Slow healing.** Left untreated, cuts and blisters can become serious infections, which may heal poorly. Severe damage might require toe, foot or leg amputation.
- **Hearing impairment.** Hearing problems are more common in people with diabetes.

XIV. Prevention of Diabetes Mellitus Type-II

Healthy lifestyle choices can help prevent type 2 diabetes. If you've received a diagnosis of prediabetes, lifestyle changes may slow or stop the progression to diabetes. A healthy lifestyle includes.

- **Eating healthy foods.** Choose foods lower in fat and calories and higher in fiber. Focus on fruits, vegetables and whole grains.



Fig. 5: Prevention of Diabetes Mellitus Type II.

- **Exercise.** Aim for 150 or more minutes a week of moderate to vigorous aerobic activity, such as a brisk walk, bicycling, running or swimming.
- **Losing weight.** If you are overweight, losing a modest amount of weight and keeping it off may delay the progression from prediabetes to type 2 diabetes. If you have prediabetes, losing 7% to 10% of your body weight may reduce the risk of diabetes.
- **Avoiding long stretches of inactivity.** Sitting still for long periods of time can increase the risk of type 2 diabetes. Try to get up every 30 minutes and move around for at least a few minutes.

For people with prediabetes, metformin (Fortamet, Glumetza, others), a diabetes medication, may be prescribed to reduce the risk of type 2 diabetes. This is usually prescribed for older adults who are obese and unable to lower blood sugar levels with lifestyle changes.

XV. Role of Unani Medicine in Diabetes

More than 400 traditional plants have been reported so

far, to possess hypoglycaemic activity. However, very few of them could yield confirmed activity after fractionation.^[7] The use of medicinal plants and herbal drugs have been in practice since the ancient times. Unani treasures possess a lot of natural origin anti-diabetic agents which are not only effective and potent to control glucose level but also they are equally safe and less harmful as compare to their modern counterparts. Unani physicians are prescribing various Mufrad (single) and Murakkab (compound) drugs successfully in the management of diabetes mellitus particularly type II. As it was previously thought that the causes of diabetes lie in the kidneys, so all drugs in the management of diabetes are mentioned in the old Unani literatures to cool down the hotness of kidney and protect the kidney. The first principle of the treatment of diabetes according to old Unani literatures is to quench the thirst, for this purpose, Arq-e-Gulab or Usara-e-Gulab should be given. Other drugs reported to control the diabetes mellitus are Mas-Shayeer (Barley water), Ashreba Mauttiya Mubarrida (Cold syrup), Qurs-e-Kafoor, Qurs-e-Tabasheer, Qurs-e-Ziabetes.^[6]

Many plants have been Reported to Possess Hypoglycaemic and Anti-Hyperglycaemic.

A. Tukhm-E-Hayat: *Withania coagulans* Dunal

There are two species of *Withania* viz. *Withania somniferum* and *Withania coagulans* which is distributed in east of the Mediterranean region extending to south asia, also found in India.^[19] It is commonly known as "Indian cheese maker" or "vegetable rennet" because fruits and leaves of this plant are used as coagulant.^[21] It is rigid grey-tomentose undershrub 60-120cm high.^[9] Dried fruits used in dyspepsia and flatulent colic. Ripe fruits are beneficial in chronic liver complaints. Seeds are useful in lumbago. Ophthalmia and inflammatory piles.^[8] The active principle named "Withania" residing in the numerous small seed contained within the capsule. It contains enzyme, amino acid (proline, valine, tyrosine), fatty oil and alkaloid (14 alkaloid fractions have been isolated from the alcoholic extract of the fruit, but they have not yet been characterized.^[6,7,20] *Withania coagulans* exhibited hypoglycaemic activity which is an effective and safe alternative treatment of diabetes.^[20] The hot aqueous extract of fruit of *W. coagulans* has been reported to possess hypoglycemic effect in normal and severely diabetic animals after 7 days of treatment.^[21]

B. Maghz-e-neem: *Azadirachta indica*

Neem tree, which is also known as *Azadirachta indica*, is one of the best known trees in India, which is known for its medicinal properties.^[27] Neem is a tropical, large size tree is about 12-18 m in height. Two species of *azadirachta* have been reported, *Azadirachta indica* A. Juss - native to Indian subcontinent and *Azadirachta excelsa* kack-confined to Philippines and Indonesia.^[29] In Sanskrit it is called as „Arishtha“ which carries the meaning as the reliever of sickness.^[27] Biological active principles include azadirachtin, meliacin, nimbin and gedunin.^[29] It

is therapeutically used in various disease like acne, amenorrhoea, eczema.^[31] With its extremely bitter properties, neem has been used in disorders caused by over eating sweets.^[29] The dried flower is taken orally for diabetes.^[30] Pharmacological hypoglycaemic action of azadirachta indica has examined in diabetic rat. After 24 hrs azadirachta indica 250mg/kg reduced glucose (18%).^[28,30]

C. Asghand: *Withania coagulans* Dunal

Ashwagandha is known Indian Ginseng. Out of withania genus 3 species are found in India *w.somniferum*, *W. coagulans*, *W. obtusifolia*.^[35] Two varieties of Asghand have been mentioned in classical Unani literature Asghand Nagori and Asghand Dakani.^[14] *Withania* is a small, erect, ever green woody under shrub and 30-50 cm in height.^[32] It is distributed in tropical and sub-tropical region.^[35] Root of *withania* *somniferum* used for the treatment and contain several alkaloids.^[33] The main active constituents are alkaloids(*withanine*, *somniferine*, *somnine* etc) & steroid as lactones (*tropine* & *cuscohygrine*).^[33,35] A clinical trial concluded that it was efficient in reducing higher sugar level, potentiating the immune system & improving the antioxidant status of diabetic patient.^[33] A pharmacological study concluded that *W. somnifera* enhance the learning and memory potential in rat.^[34]

XVI. House Hold Remedies for Diabetes

A. Curry Leaves For Diabetes

Curry leaves are the best natural antioxidants. They are known to control high blood sugar levels. When mixed with cinnamon and fenugreek seeds, they increase glucose absorption by cells. Studies have revealed curry leaves, when included in a diabetes diet, reduce fasting as well as postprandial blood sugar levels. Diabetes Reversal Diet includes smoothies and drinks that act as antioxidants, thus regulating blood sugar levels. Here is the recipe for one of the home remedies for high sugar, and we bet you have all the ingredients available in your kitchen. Benefits of Curry Leaves for Diabetes includes.

- **Regulates Blood Sugar Levels:** Curry leaves for diabetes contain compounds that help lower blood glucose levels by affecting insulin activity and glucose metabolism. Curry leaves lower both fasting sugar levels and postprandial sugar levels.
- **Improves Insulin Sensitivity:** These leaves enhance insulin sensitivity, making cells more responsive to insulin, and thereby aiding better glucose utilization.
- **Rich in Antioxidants:** Curry leaves are a good source of antioxidants, which help protect cells from oxidative stress often seen in diabetes.



Fig. 6: Jamun & Curry leaves used in treatment of Diabetes Mellitus Type II.

B. Jamun Seeds For Diabetes (Jamun Seeds Powder)

Jamun seeds (Blackberries) are considered among the effective home remedies for diabetes. These seeds are a rich source of jamboline and jambosine. These two ingredients help in slowing down the glucose release into the blood. It also reduces symptoms of frequent urination and thirst. A study published in the National Library of Medicine says jamun decreased HbA1c in diabetes patients who participated in the study. From 11.1% of HbA1c, jamun consumption for over 12 weeks brought HbA1c down to 5.6%. Check how to make this one of the most effective home remedies for diabetes: Check how to make this, one of the most effective home remedies for diabetes: Benefits of Jamun Seeds for Diabetes includes.

- **Natural Blood Sugar Regulation:** Jamun seeds contain compounds that can help lower blood sugar levels by enhancing insulin sensitivity and improving glucose utilization.
- **Reduces Glycemic Load:** Consuming Jamun seed powder may reduce the glycemic load of meals, leading to slower and steadier glucose release, which is beneficial for diabetes control.
- **Stimulates Insulin Production:** Certain bioactive compounds in Jamun seeds are believed to stimulate insulin production from pancreatic cells, which is essential for blood sugar regulation.
- **Weight Management:** By supporting metabolism and controlling hunger, Jamun seed powder can be a valuable tool in weight management, an essential aspect of diabetes care.
- **Rich in Nutrients:** Jamun seeds contain essential nutrients, including fiber and micronutrients, which can contribute to a balanced diet for people with diabetes.

C. Fenugreek Seeds

Fenugreek seeds (Methi seeds) are a rich source of glucomannan fiber. This fiber helps in delaying the intestinal absorption of sugar. Alkaloids like fednugrecin and amino acids 4 hydroxy isoleucine present in the seed act on the pancreas to release insulin, thereby helping in high sugar control. Follow the steps below and benefit from one of the most effective and common natural remedies for diabetes. Fenugreek seeds offer unique benefits for diabetes management.



Fig. 7: Fenugreek and Amla used in treatment of Diabetes Mellitus Type II.

- **Improved Insulin Sensitivity:** Fenugreek seeds may enhance insulin sensitivity, helping the body utilize glucose more effectively, which is vital for diabetes control.
- **Reduced Post-Meal Glucose Levels:** Fenugreek can slow the absorption of carbohydrates, leading to lower post-meal blood sugar spikes and promoting better glucose regulation.
- **Lower HbA1c Levels:** Regular consumption of fenugreek seeds has been associated with reduced HbA1c levels, indicating improved long-term blood sugar control, one of the most effective home remedies for high sugar.
- **Increased Insulin Production:** Fenugreek may stimulate insulin secretion from pancreatic cells, contributing to better blood sugar management.
- **Fiber-Rich Aid:** Fenugreek seeds are high in soluble fiber, which can help stabilize blood sugar levels by slowing carbohydrate absorption and reducing insulin resistance.

D. Amla Juice For Diabetes

Indian gooseberries or amla are powerful antioxidants. When it comes to thinking of the best home remedies for high sugar, Amla is a perfect choice. As it is a rich source of Vitamin C, amla's have been widely used for immunity boosting. Studies have shown amla also lowers postprandial sugar levels.

Amla can control pancreatitis and thus helps in the proper production of insulin. It increases the body's

response toward insulin and regulates carbohydrate metabolism, all helping in controlling high blood sugar levels. Amla juice, derived from the Indian gooseberry, offers unique benefits as one of the most trusted home remedies for high blood sugar.

- **Low Glycemic Index (GI):** Amla juice has a low GI, which means it causes a gradual and steady rise in blood sugar levels, making it a suitable option for people with diabetes.
- **Rich in Vitamin C:** Amla is a potent source of vitamin C, which has antioxidant properties that may help reduce oxidative stress and inflammation, contributing to better diabetes control.
- **Improved Insulin Sensitivity:** Amla may enhance insulin sensitivity, making cells more responsive to insulin, which is crucial for glucose utilization.
- **Glucose Metabolism:** Amla may help regulate glucose metabolism and prevent sudden spikes in blood sugar levels.
- **Pancreatic Function:** Some studies suggest that amla may support pancreatic function, aiding in insulin secretion and maintaining blood sugar balance.

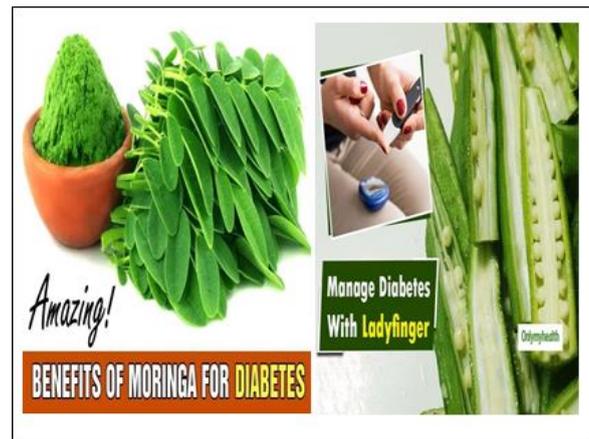


Fig. 8: Moringa and Ladyfinger used in treatment of Diabetes Mellitus Type II.

E. Lady Finger For Diabetes (Okra)

Okra, popularly known as bhindi or ladyfinger, is a great source of fiber, vitamins, and minerals. It is a low-calorie and low glycemic index diet. For people who continuously think of "home remedies for high blood sugar", Okra is a perfect food item for them. Studies have shown okra improves glycemic control in diabetes patients. Myricetin present in Okra helps in increasing cellular absorption of blood glucose. The green peel and the seeds of the plant help in lowering blood sugar by slowing down the sugar absorption from the intestines. Thus, it helps in reducing blood sugar levels. Make your Okra drink and improve your blood sugar levels. Ladyfinger, also known as okra or bhindi, offers unique benefits for diabetes management.

- **Low Glycemic Index (GI):** Ladyfinger has a low GI, which means it can help regulate blood sugar levels by preventing rapid spikes.

- **Rich in Dietary Fiber:** Ladyfinger is a good source of dietary fiber, which aids in slowing down the absorption of sugar in the digestive system, promoting better blood sugar control.
- **Natural Insulin-Like Properties:** Some studies suggest that certain compounds in ladyfinger may have insulin-like properties, potentially improving insulin sensitivity.
- **Stabilized Blood Sugar:** The combination of low GI and fiber content helps stabilize blood sugar levels, reducing the risk of sudden spikes and crashes.

F. Moringa or Drum Sticks

Moringa is constituted with rich medical benefits that assist in regulating the levels of blood glucose as well as one of the best home remedies for high sugar. It is found to contain antioxidants and vitamin C. Studies have also found moringa helps in increasing insulin production in your body. Moringa, commonly known as drumsticks (referring to the long edible pods), offers unique benefits for diabetes management.

- **Blood Sugar Regulation:** Moringa leaves and pods contain compounds that may help regulate blood sugar levels by improving insulin sensitivity and reducing glucose absorption in the intestines.
- **Nutrient-Rich:** Moringa is a nutritional powerhouse, packed with essential vitamins (A, C, E, K), minerals (calcium, magnesium, potassium), and protein. These nutrients support overall health, which is important for managing diabetes.
- **High Fiber Content:** The drumstick pods are a good source of dietary fiber, promoting slower digestion and better blood sugar control.
- **Potential Insulin-Like Effects:** Certain compounds in moringa may have insulin-like properties, although more research is needed to fully understand this aspect.

G. Apple Cider Vinegar

Apple cider vinegar is often considered the best home remedy for diabetes type 2, although its effects are subjective. The primary compound in Apple Cider Vinegar is acetic acid. Acetic acid is thought to account for the majority of its health benefits. A lot of evidence-based approaches have existed for using ACV. Two tablespoons of ACV are taken before bedtime. This helps in decreasing the morning fasting glucose levels. Even better, one to two tablespoons of apple cider vinegar can be consumed with meals. This helps in reducing the glycemic load of a carb-rich meal. Apple cider vinegar (ACV) has gained popularity for its potential health benefits, including some that could make it the best home remedy for diabetes type 2. Here are some unique benefits of apple cider vinegar for diabetes.

- **Improved Insulin Sensitivity:** ACV may enhance insulin sensitivity, helping the body use insulin more effectively, which is beneficial for managing blood sugar levels.
- **Reduced Post-Meal Glucose Spikes:** Consuming

ACV before meals may lead to a slower rise in blood sugar levels after eating, potentially reducing the post-meal glucose spike.

- **Enhanced Carbohydrate Digestion:** ACV may slow down the digestion of carbohydrates, leading to a gradual release of glucose into the bloodstream, promoting better blood sugar control.

H. Cinnamon

Cinnamon, an aromatic spice with a rich history, holds potential benefits for diabetes management. Its unique properties make it a popular choice in natural remedies. Studies have also shown cinnamon helps in decreasing insulin resistance. Discover how cinnamon can positively impact blood sugar levels.

- **Improved Insulin Sensitivity:** Cinnamon may enhance insulin sensitivity, assisting cells in using insulin more efficiently to regulate blood sugar levels.
- **Glucose Metabolism:** Cinnamon may aid in regulating glucose metabolism, potentially preventing rapid spikes in blood sugar after meals.
- **Lower Fasting Blood Sugar:** Some studies suggest that cinnamon consumption might contribute to lowering fasting blood sugar levels.

CONCLUSION

Diabetes Mellitus is becoming most prevalent and fastest considerable disease in the world and affects millions of people. Unani physicians have described and discussed in detail about the different aspects of diabetes mellitus. In USM there are many plants possess varying degrees of hypoglycaemic and antihyperglycaemic activity, which are used in the prevention, treatment and control of diabetes and its complication. By reviewing Unani literature it was concluded that there are lot of herbal drugs having anti diabetic property are being used for treatment of diabetes mellitus.

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