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## A Brief Review on Diabetes Mellitus and it's Treatment

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**Abstract:** A **disease** is an abnormal condition affecting the body of an organism. It is often construed to be a **medical condition** associated with specific symptoms and signs. It may be caused by external factors, such as infectious disease, or it may be caused by internal dysfunctions, such as autoimmune diseases. Ecologically, disease is defined as maladjustment of a body with environment. In humans, "disease" is often used more broadly to refer to any condition that causes pain, dysfunction, distress, Diabetes is a condition whereby the body is not able to regulate levels of glucose (a sugar) in the blood, resulting in too much glucose being present in the blood. The word Diabetes was coined by *Aerates* (81133 CE) of Cappadocia. The word is derived from the Greek *diabanein*, which literally means "passing through" or "siphon", a reference to one of the main symptoms of Diabetes - excessive urine discharge. Glucose is the main sugar that comes from the digestion of the foods that we eat and the liquids that we drink. For example, breads, cereals, dairy foods (such as milk), fruits, and some vegetables that contain carbohydrates in the forms of starches and sugars. When eaten, these are broken down in our digestive tract and absorbed into the blood stream as glucose.

**Keywords:** Diabetes Mellitus, Diabetes Mellitus Treatment

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### Introduction

#### Diabetic mellitus:

Often referred to simply as diabetes—is a condition in which the body either does not produce enough, or does not properly respond to, insulin, a hormone produced in the pancreas. Insulin enables cells to absorb glucose in order to turn it into energy. In diabetes, the body either fails to properly respond to its own insulin, does not make enough insulin, or both. This causes glucose to accumulate in the blood, often leading to various complications. A diabetic is a chronic disease. 1552 BC earliest + known recorded of diabetes mentions Polyuria. Diabetes mellitus is a disease in which the body is unable to properly use and store glucose. As a form of sugar the body completely stops producing any insulin. But can occur at any age.

#### Types of Diabetics

Type 1 diabetes mellitus is characterized by loss of the insulin-producing beta cells of the islets of Langerhans in the pancreas leading to a deficiency of insulin. This type of diabetes can be further classified as immune-mediated or idiopathic. The majority of type 1 diabetes is of the immune-mediated nature, where beta cell loss is a T-cell mediated autoimmune attack. There is no known preventive measure which can be taken against type 1 diabetes, which contain approximately 10% of diabetes mellitus cases in the principal treatment of type 1 diabetes, even in its earliest stages, is the delivery of artificial insulin via injection combined with careful monitoring of blood glucose



levels using blood testing monitors. Without insulin, diabetic ketoacidosis often develops which may result in coma or death. Treatment emphasis is now also placed on lifestyle adjustments (diet and exercise) though these cannot reverse the progress of the disease.

**Type 2 diabetes:**

Type 2 diabetes mellitus is characterized differently and is due to insulin resistance or reduced insulin sensitivity, combined with relatively reduced insulin secretion which in some cases becomes absolute. The defective responsiveness of body tissues to insulin almost certainly involves the insulin receptor in cell membranes. However, the specific defects are not known. Diabetes mellitus due to a known specific defect are classified separately.

In the early stage of type 2 diabetes, the predominant abnormality is reduced insulin sensitivity, characterized by elevated levels of insulin in the blood. At this stage hyperglycemia can be reversed by a variety of measures and medications that improve insulin sensitivity or reduce glucose production by the liver. As the disease progresses, the impairment of insulin secretion worsens, and therapeutic replacement of insulin often becomes necessary.

**Gestational diabetes:**

Gestational diabetes mellitus (GDM) resembles type 2 diabetes in several respects, involving a combination of relatively inadequate insulin secretion and responsiveness. It occurs in about 2%–5% of all pregnancies and may improve or disappear after delivery. Gestational diabetes is fully treatable but requires careful medical supervision throughout the pregnancy. About 20%–50% of affected women develop it type 2 diabetes later in life.

Even though may be transient, untreated gestational diabetes can damage the health of the fetus or mother. Risks to the baby include macrosomia (high birth weight), congenital cardiac and central nervous system anomalies, and skeletal muscle malformations. Increased fetal insulin may inhibit fetal surfactant production and cause respiratory distress syndrome. Hyperbilirubinemia may result from red blood cell destruction. In severe cases, perinatal death may occur, most commonly as a result of poor placental perfusion due to vascular impairment. [6]

**Other types:**

Most cases of diabetes mellitus fall into the two broad etiologic categories of type 1 or type 2 diabetes. However, many types of diabetes mellitus have more specific known causes, and thus fall into more specific categories. As more research is done into diabetes, many patients who were previously diagnosed as type 1 or type 2 diabetes will have their condition reclassified. Some cases of diabetes are caused by the body's tissue receptors not responding to insulin (even when insulin levels are normal, which is what separates it from type 2 diabetes); this form is very uncommon. Genetic mutations (autosomal or mitochondrial) can lead to defects in beta cell function. Abnormal insulin action any also have been genetically determined in some cases. Any disease that causes extensive damage to the pancreas may lead to diabetes (for example, chronic pancreatitis and cystic fibrosis).

**Cause of Diabetics**

1. Both type 1 and type 2 diabetes are at least partly inherited. Type 1 diabetes appears to be triggered by some (mainly viral) infections, with some evidence pointing at Coxsackil B4 virus.
2. There is a genetic element in individual susceptibility to some of these triggers which has been traced to particular HLA genotypes. However, even in those who have inherited the susceptibility, type 1 diabetes mellitus seems to require an environmental trigger.
3. There is a stronger inheritance pattern for type 2 diabetes. Those with first-degree relatives with type 2 have a much higher risk of developing type 2, increasing with the number of those relatives. Concordance among monozygotic twins is close to 100%, and about 25% of those with the disease have a family history of diabetes.

**Pathophysiology**

Pathophysiology is the study of the changes seen in normal mechanical, physical, and biochemical functions that are either caused by a disease or the result of an abnormal syndrome. The path physiology of a given disease or syndrome describes its causes, symptoms and effects.



The path physiology of diabetes mellitus is a bit complicated. Diabetes mellitus, most commonly known only as diabetes, is a syndrome of disordered metabolism, usually due to a combination of hereditary and environmental causes, resulting in abnormally high blood sugar levels called hyperglycemia.

There are three primary types of diabetes mellitus: Type 1, Type 2, and gestational diabetes. Each is with different behaviors and triggers but all are related and characterized by shared symptoms such as hyperglycemia.

Gestational diabetes is one of the three main types. This occurs during pregnancy and usually goes away after the baby is born. Women suffering from gestational diabetes while pregnant have an increased risk of developing Type 2 diabetes later in life. There are also other risks associated with gestational diabetes for both the infant and mother such as unstable blood sugar at birth, obesity later in life and macromedia or the condition known as "fat baby".

#### **Insulin dependent:**

Symptoms of diabetes mellitus include excess thirst, excess hunger, frequent urination, fatigue, irritability, and unexplained weight loss. Diabetes can cause serious long term physical effects if not treated properly, so early detection is important. Treatment for diabetes mellitus can include lifestyle changes to diet and exercise as well as medications like insulin injections or oral insulin medications, depending on the type of diabetes mellitus that is diagnosed.

#### **Glucose metabolism:**

The effect of the insulinotropic incretion hormone, glucagons-like peptide-1 (GLP- 1), is preserved in typical middle-aged, obese, insulin-resistant type 2 diabetic patients, whereas a defective amplification of the so-called late-phase plasma insulin response (20- 120 min) to glucose by the other incretion hormone, glucose-dependent insulin tropic polypeptide (GIP), is seen in these patients. The aim of the present investigation was to evaluate plasma insulin and C-peptide responses to GLP-1 and GIP in five groups of diabetic patients with etiology and phenotype distinct from the obese type 2 diabetic patients.

#### **Lipid metabolism:**

Plasma lipid concentration and lipoprotein composition were studied before and after several months of glipizide treatment in 23 patients with non-insulin-dependent diabetes mellitus. The mean ( $\pm$ SEM) plasma glucose level fell 87 mg/dL, and the fall in plasma glucose concentration was correlated with a reduction in plasma triglyceride, very low-density lipoprotein triglyceride, cholesterol, and low-density lipoprotein cholesterol levels. Furthermore, there was a statistically significant increase in the plasma high- density lipoprotein cholesterol to total cholesterol ratio. Thus, improved diabetic control in patients treated with glipizide with non-insulin-dependent diabetes mellitus leads to changes in lipoprotein metabolism thought to be beneficial in terms of known cardiovascular risk factors.

#### **Protein metabolism:**

Patients with insulin-dependent diabetes are in a catabolic state without insulin re placement. The mechanism of insulin's anticatabolic effect has been investigated in whole-body and regional tracer kinetic studies. Whole-body studies have demonstrated that there are increases in both protein breakdown and protein synthesis during insulin deprivation. Because the magnitude of the increase in protein breakdown is greater than the magnitude of the increase in protein synthesis, there is a net protein loss during insulin deprivation. Regional studies have shown that insulin replacement inhibits protein breakdown and synthesis in splanchnic tissue but only inhibits protein breakdown in skeletal muscle. Because the increase in protein synthesis in splanchnic tissues is greater than the increase in protein breakdown, insulin deprivation results in a net accretion of protein in the splanchnic bed. In contrast, in skeletal muscle, there is a net increase in protein breakdown during insulin deprivation, resulting in a net release of amino acids.

#### **Non-insulin dependent:**

Diabetes mellitus type 2 or type 2 diabetes is a disorder that is characterized by high blood glucose in the context of insulin resistance and relative insulin deficiency. While it is often initially managed by increasing exercise and dietary modification medications are typically needed as the disease progresses. There are an estimated 23.6 million people in the U.S. (7.8% of the population) with diabetes with 17.9 million being diagnosed, 90% of whom are type 2. With prevalence rates doubling between 1990 and 2005, CDC has characterized the increase as an epidemic.



## **Treatment of Diabetics**

### **Treatment by Herbal Drugs:**

A compound herbal drug was investigating for its possible antidiabetic.

Herbal medicine also called botanical medicine or phytomedicine refers to using a plant's seeds, berries, root leaves, bark or flowers for medicinal purposes herbal medicine is used to treat many conditions, such as asthma, eczema, premenstrual syndrome, rheumatoid arthritis, migraine menopausal symptoms, chronic fatigue and irritable's bowel syndrome, among others. The herbs available in most stores come in several different from 1- teas, syrups, oil, liquid extracts, tinctures and dry extracts.

Herbal drug and plant use in the treatment of diabetes thought here are various approaches to reduces the ill effect of diabetes & its secondary complication herbal formulations are preferred due to lesser side effect & low cost. The current review focuses on herbal drug preparation & plants used in the treatment of diabetes mellithung a mayor crippling disease in the world leading to thing exnomic lossess. Some herbal drugs are used in Antidiabetes and control the blood sugar level.

In the herbal medicine the gurm – resisn looks like dried blood (Dragon;s Blood) much used in Indian medicine, treatment of diabetes it also help and preventing some of the tissue and organ damages associated with uncontrolled blood sugar levels. [11]

### **Treatment by Homeopathic Drugs:**

The homeopathy drugs used in diabetes can be classified in to six groups namely acids, metals, other minerals, vegetables, drugs from animals, and organo therapic remedies. The acids used for treatment of diabetes are acetic acid, lactic acid, phosphoric acid, nitric acid, picric acid, carbolic acid, and flouric acid. Acids are often used in patients with debility or persistent weakness. Acid can prevent acidosis one of the greatest dangers of diabetic mellitus. Metals Aurum met, Argentum met, Argentum nitricum, Uranium nitricum, Vanadium, Plumbum met, Cup ars are used in patients with diabetes. Other minerals (such as Ars alb, Sulphur, Silicea, Iodum, Natrum sulph), vegetables (such as Cephalandra indica, Chimaphilla, Chionanthus, China, Curara, Nux vom, Helleborus niger), and products from Animal kingdom (such as Moschus, Crotalus horridus, Lachesis, Tarentula, Lac defloratum) are prescribed based on the individual characteristics and symptoms of the patients.

### **Treatment by Allopathic Drugs:**

Meeting the demands of the diabetic patients, we offer quality array of active antidiabetic drugs across the country. Prepared using apt formulation of Glimipiride, Metformin and Pioglitazone these medicines are highly effective and comply with the latest developments of the medical industry. Proper intake as prescribed by doctor help in maintaining an appropriate sugar level inside the body. These drugs are available in different dosage quantity and packaging as per customer requirements. Our range of active antidiabetic drugs includes generic gliclazide drugs, generic antidiabetic drugs, antidiabetic glimipiride, antidiabetic glipizide, antidiabetic pioglitazone and antidiabetic metformin.

## **Conclusion**

From this we concluded that the available treatment for Diabetic is good. But there is a few limitations related to their drug combination of all these treatments. So, we need to improve the drug combination, Drug regimen, dosage schedule along with need to take the support of another available treatment by which we can improve the community health. The available treatments like YOGA will be beneficial over the other treatments. So, we need to take support from other treatments to control the diseases.

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