Herbs Used In Treatment Of Diabetes Mellitus

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Abstract— Diabetes mellitus is a growing health problem in the world that causes severe morbidity and mortality. The prevalence of diabetes was rising day by day.The facts about the diabetes mellitus, its prevalence, morbidity, and mortality were published in many statistical reports. Diabetes mellitus (DM), or simply diabetes, is a group of metabolic diseases in which a person has high blood sugar,either because the body does not produce enough insulin, or because cells do notrespond to the insulin that is produced. This high blood sugar produces the classical symptoms of polyuria (frequent urination), polydipsia (increased thirst) and polyphagia (increased hunger)

Keywords:
Diabetes mellitus, Types, Insulin, Diagnosis, autoimmune, Gestational diabetes, Monogenic.

INTRODUCTION

Diabetes mellitus is a common and very prevalent disease affecting the citizens of both developed and developing countries. It is estimated that 25% of the world population is affected by this disease. Diabetes mellitus is caused by the abnormality of carbohydrate metabolism which is linked to low blood insulin level or insensitivity of target organs to insulin . Despite considerable progress in the treatment of diabetes by oral hypoglycemic agents, search for newer drugs continues because the existing synthetic drugs have several limitations. The herbal drugs with anti-diabetic activity are yet to be commercially formulated asmodern medicines, even though they have been acclaimed for their therapeutic properties in the traditional systems of medicine . Type 2 diabetes usually occursin obese individuals and is associated with hypertension and dyslipidemia. Thus the treatment aims to reduce insulin resistance and to stimulate insulin secretion. Diabetes is a metabolic disorder where in human body does not produce or properly us insulin, a hormone that is required to convert sugar, starches, and other food into energy. Diabetes mellitus is characterized by constant high levels of blood glucose (sugar). Human body has to maintain the blood glucose levels at a very narrow range which is done with insulin and glucagon. The function of glucagon is causing the liver to release glucose from its cells into the blood for the production of energy. Type 1 Diabetes leads to inability to

release insulin results in low rates of glucose uptake into muscles and adipose tissue.

EPIDEMIOLOGY:

It is estimated that 366 million people had DM in 2011; by 2030 this wouldhave risen to 552 million. The number of people with type 2 DM is increasing inevery country with 80% of people with DM living in low- and middle-income countries. DM caused 4.6 million deaths in 2011. It is predicted that the prevalence of DM in adults of which type 2 DM is becoming prominent will increase in the next two decades and much of the increase will occur in developing countries where the majority of patients are aged between 45 and 64 years

Diabetes in India

According to recent estimates, approximately 285 million people worldwide (6.6%) in the 20–79 year age group will have diabetes in 2010 and by2030, 438 million people (7.8%) of the adult population, is expected to have diabetes. India leads the world with largest number of diabetic subjects earning the dubious distinction of being termed the "diabetes capital of the world". According to the Diabetes Atlas 2006 published by the International Diabetes Federation, the number of people with diabetes in India currently around 40.9 million is expected to rise to 69.9 million by 2025 unless urgent preventive steps are taken. The "Asian Indian Phenotype" refers to certain unique clinical and biochemical abnormalities in Indians which include increased insulin resistance,greater abdominal adiposity i.e., higher waist circumference despite lower body mass index, lower adiponectin and higher high sensitive C-reactive protein levels.Higher prevalence of diabetes mellitus often results from in changes in dietary patterns and decreased physical activity in the urban population.

CLASSIFICATION OF DIABETES

Classification is based on the production of insulin by the pancreas or the cells ofthe body response properly towards the insulin production. There are three main types of diabetes mellitus

Insulin Dependent Diabetes Mellitus (Type1 IDDM)

It is also called as Type 1 diabetes mellitus. This type of diabetes mellitus is also called autoimmune diabetes and previously known as juvenile-onset or ketosisprone diabetes. The individual may also seek with other autoimmune disorders such as Graves' disease, Hashimoto's thyroiditis, and Addison's disease In this type of diabetes pancreas does not produced insulin properly or no insulinis produces by pancreas. It is also known as insulin dependent diabetes mellitus (IDDM) or juvenile diabetes or early onset diabetes. The causes for type 1 diabetes are unknown. It is less common than type 2, generally only 10% of all diabetes case is type 1. Patients suffering from type 1 diabetes should take insulin injections for rest of their life. They should likewise guarantee appropriate blood-glucose levels via doing consistent blood tests and taking after an uncommon eating routine.[2] The main cause of type I or Juvenile diabetes is due to autoimmune insulitis, where the insulin-producing beta cells in the pancreas are destructed bythe body's defense system. As a result, the body is unable to produce sufficient insulin that needs. Hence type I diabetes requires exogenous insulin therapy to survive. The other causes of type 1 dm are genetic and environmental factors suchas viral infection and certain chemicals. Despite the fact that this disease usuallyoccurs in children or young adults, it can also affect people irrespective of age. Type I diabetes is less common and accounts for only about 10% of the diabetic people.

Non-Insulin Dependent Diabetes Mellitus (Type2 NIDDM)

It is also called as Type 2 diabetes mellitus. Type 2 diabetes mellitus is also known as adult-onset diabetes. The progressive insulin secretary defect on the background of insulin resistance (American Diabetes Association, 2014). People with this type of diabetes frequently are resistant to the action of insulin. The long-term complications in blood vessels, kidneys, eyes and nerves occur in both types and are the major causes of morbidity and death from diabetes. The causes are multifunctional and predisposing factor includes: Obesity, Sedentary lifestyle, increasing age (affecting middle aged and older people), Genetic factor (Ross and Wilson 2010), such patients are at increased risk of developing macro vascular and micro vascular complications. In type 2 diabetes the body does not create enough insulin to address its own particular issues or cell does not respond properly against the insulin. This is known as insulin resistance. Type 2 diabetes is also known as "Non-Insulin- Dependent Diabetes Mellitus" (NIDDM) or "adult-onset diabetes". It happens in 75 to 90% of all instances of diabetes in UK. Type 2 diabetes as a rule grows steadily after some time. Most people with the condition might be ignorant of their ailment particularly at early stages as there might be no particular side effects. Type 2 diabetes is frequently connected with weight. Corpulence relateddiabetes is now and then alluded to as development onset diabetes since it is morenormal in more seasoned individuals. In numerous early instances of type 2 diabetes treatment might be conceivable by simply eating a solid eating regimen and checking blood glucose levels routinely. In any case, as type 2 diabetes is a dynamic condition in the long run medicines might be required. There are a few gatherings of oral pills that can be taken to control the glucose. In some serious type 2 diabetics insulin infusions might be vital.

Gestational diabetes

It is the third type of diabetes. This type affects female during pregnancy. A fewladies have large amounts of glucose in their blood, and their bodies can't create enough insulin to transport the greater part of the glucose into their cells, bringingabout dynamically rising levels of glucose. Pregnant ladies with gestational diabetes could conceivably have prior type 1 or type 2 diabetes. Much of the time, gestational diabetes creates amid the second trimester of pregnancy (weeks 14- 26) and vanishes after the child is conceived. Gestational diabetes can build the danger of wellbeing issues creating in an unborn infant.

Plants With Antidiabetic And Related Beneficial effects:-

There are many herbal remedies suggested for diabetes and diabetic complications. Medicinal plants form the main ingredients of these formulations. A list of medicinal plants with anti-diabetic and related beneficial effects is given.

1). Aloe vera

Aloe, a popular houseplant, has a long history as a multipurpose folk remedy. The plant can be separated into two basic products: gel and latex. Aloe vera gel is the leaf pulp or mucilage, aloe latex, commonly referred to as "aloe juice," is a bitter yellow exudate from the pericyclic tubules just beneath the outer skin of the leaves. Treatment of chronic but not single dose of exudates of Aloe barbadense leaves showed hypoglycemic effect in alloxanized diabetic rats. Single as well as chronic doses of bitter principle of the same plant also showed hypoglycemic effect in diabetic rats.

2) Acacia arabica: (Babhul)

Skin hydration tests revealed a significant It is found all over India mainly in the wild habitat. The plant extract acts as an antidiabetic agent by acting as secretagogue to release insulin. It induces hypoglycemia in control rats but not in alloxanized animals. Powdered seeds of Acacia arabica when administered (2,3 and 4 g/kg body weight) to normal rabbits induced hypoglycemic effect by initiating release of insulin from pancreatic beta cells. moisturizer creams play a crucial role in maintaining healthy and nourished skin. They offer a range of benefits that contribute to the overall well-being and appearance of the skin. Here are the key roles of moisturizer creams: Hydration: One of the primary functions of moisturizer creams is to provide hydration to the skin. They replenish moisture levels by attracting water to the skin and sealing it in, preventing dehydration.

3) Aegle marmelos: (Bengal Quince, Bel or Bilva)

Administration of aqueous extract of leaves improves digestion and reduces blood sugar and urea, serum cholesterol in alloxanized rats as compared to control. Along with exhibiting hypoglycemic activity, this extract also prevented peak rise in blood sugar at 1h in oral glucose tolerance test.

4) Allium cepa: (onion

Various ether soluble fractions as well as insoluble fractions of dried onion powder show antihyperglycemic activity in diabetic rabbits. Allium cepa is also known to have antioxidant and hypolipidemic activity. Administration of a sulfur containing amino acid from Allium cepa, S-methyl cysteine sulphoxide (SMCS) (200 mg/kg for 45 days) to alloxan induced diabetic rats significantly controlled blood glucose as well as lipids in serum and tissues and normalized the activities of liver hexokinase, glucose 6- phosphatase and HMG Co A reductase

PATHOGENESIS:

Type 1 diabetes mellitus is an autoimmune disorder connected with specific annihilation of insulin producing pancreatic β -cells. The onset of diseases shows the end phase of β -cell annihilation proceeding type 1 diabetes mellitus. There are a number of features represent that type 1 diabetes mellitus is an autoimmune disorder:
The pathogenesis of specific β -cell pulverization inside the islet in type 1 diabetes mellitus is hard to take after because of checked heterogeneity of the pancreatic sores. At the onset of plain hyperglycemia, a blend of pseudoatrophicislets with cells creating glycogen (a cells), somatostatin (d cells) and pancreatic poly-peptide (PP cells), typical islets, and islets containing both b-cells and penetrating lymphocytes and monocytes might be seen. Lymphocytic invasion isdiscovered just in the islet containing leftover β -cells and is likely that the chronicity with which type 1 diabetes mellitus creates mirrors this heterogeneityof islet injuries. Alloantigen RT6 in CD4+ cell is not present in diabetes inclined BB rats and seem to ensure AO rats from MLD-STZ incited

DIAGNOSIS:

According to the Americal Diabetes Association (ADA), the fasting glucose concentration should be used in routine screening for diabetes; but postprandial blood sugar, random blood sugar and glucose tolerance test are also used for blood sugar determination. For the diagnosis of diabetes, at least one criterion must apply.

Herbal treatment of diabetes.

In the last few decades eco-friendly, bio-friendly, cost effective and relatively safe, plant-based medicines have moved from the fringe to the main stream with the increased research in the field of traditional medicine. There are several literature reviews by different authors about anti-diabetic herbal agents, but the most informative is the review by Rahman who has documented more than 300 plant species accepted for their use.

DISCUSSION

Diabetes is a disorder of carbohydrate, fat and protein metabolism caused due toinsufficient production of insulin or due to its inhibitory action, which can be considered as a major cause of high economic loss which can in turn impede the development of nations. Before there were drugs from drug companies, natural cures were used and they can still be used today. There are many herbs with stronganti-diabetic properties. Herbal treatments for diabetes have been used in patients with insulin dependent and non-insulin dependent diabetes, diabetic retinopathy, diabetic neuropathy etc.The families of plants with the most potent hypoglycaemic effects include Leguminoseae, Lamiaceae, Liliaceae, Cucurbitaceae, Asteraceae, Moraceae, Rosaceae, Euphorbiaceae and Araliaceae. The most commonly studied species are: Opuntia streptacantha, Trigonella foenum graecum, Momordica charantia, Ficus bengalensis, Polygala senega and Gymnema sylvestre. In the experiments,oral glucose tolerance test, streptozotocin and alloxan-induced diabetic mouse or rat were most commonly used model for the screening of antidiabetic drugs. Numerous mechanisms of actions have been proposed for plant extracts. Some hypothesis relates to their effects on the activity of pancreatic beta cells, increase in the inhibitory effect against insulinase enzyme, increase of the insulin sensitivity or the insulin-like activity of the plant extracts

properties. This review has classified the plants according to their botanical name, country of origin; parts used and nature of active agents. One such plant is. WHO has listed 21,000 plants, which are used for medicinal purposes around the world? Amongthese 2500 species are in India, out of which 150 species are used commercially on a fairly large scale. India is the largest producer of medicinal herbs and is called the botanical garden of the world.

Conclusion:

We discussed about medicinal plants for the treatment of Diabetes mellitus. Medicinal plants are mostly used for rural areas; because the availability of lavish number of medicinal plants those areas. Therefore, treating diabetes mellitus with plant derived compounds which are accessible and do not require laborious pharmaceutical synthesis seems highly attractive. In the present review an attempt has been made to investigate the anti-diabetic medicinal plants and may be useful to the health professionals, scientists and scholars working in the field of pharm the term diabetes mellitus includes several different metabolic disorders that all, if left untreated, result in abnormally high concentration of a sugar

called glucose in the blood. Diabetes mellitus type 1 results when the pancreas no longer produces significant amounts of the hormone insulin, usually owing to the autoimmune destruction ofthe insulin-producing beta cells of the pancreas. Diabetes mellitus type 2, in contrast, is now thought to result from autoimmune attacks on the pancreas and/orinsulin resistance. The pancreas of a person with type 2 diabetes may be producing normal or even abnormally large amounts of insulin**.**

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