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[ijirset@gmail.com](mailto:ijirset@gmail.com)

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# “A Review article on “Diabetes Mellitus”

**Gulzar Alamgaun, Dr Gaurav Kumar Sharma, Dr Kaushal Kishore Chandrul.**

Student of B.Pharmacy 4<sup>th</sup> year, Department of Pharmacy Mewar University, Chittorgarh (Raj), India

HOD, Department of Pharmacy Mewar University Chittorgarh (Raj), India

Principal, Department of Pharmacy Mewar University Chittorgarh (Raj), India

**ABSTRACT:** Diabetes (DM), or simply diabetes, is a group of metabolic disorders in which a person has hyperglycaemia because the body does not produce enough insulin or cells. Responds to the insulin produced. This hyperglycaemia causes the classic symptoms of Polyuria (frequent urination), polydipsia (increased thirst) and polyphagia (increased hunger). Traditionally, diabetes can be divided into three types. That is, with type 1 diabetes or insulin-dependent diabetes mellitus (IDDM), the body does not produce insulin. pump. This is also known as "juvenile diabetes". Type 2 diabetes or non-insulin-dependent diabetes mellitus (NIDDM) results from insulin resistance. This is a condition in which cells do not use insulin properly, with or without absolute insulin deficiency. The third major type is gestational diabetes. It occurs when a woman with no history of diabetes develops hyperglycemia during pregnancy.

**KEYWORDS:** Diabetes Mellitus, Metabolic Disorder, Insulinoma, hyperinsulinemia, adiponectin, insulin

## I. INTRODUCTION

Diabetes mellitus (DM) is probably one of the oldest diseases known to man. It was first reported in Egyptian manuscript about 3000 years ago [1]. Diabetes mellitus has been classified into two types i.e. insulin dependent diabetes mellitus (IDDM, Type I) and non-insulin dependent diabetes mellitus (NIDDM, Type II). Type I diabetes is an autoimmune disease characterized by a local inflammatory reaction in and around islets that is followed by selective destruction of insulin secreting cells whereas Type II diabetes is characterized by peripheral insulin resistance and impaired .

It may precede the onset of type 2 diabetes. The medications currently available to treat diabetes include insulin and oral hypoglycaemic agents. Such drugs act by increasing insulin secretion from the pancreas or by reducing plasma glucose levels by increasing glucose uptake and reducing gluconeogenesis. However, these current medicines do not restore normal glycemic homeostasis over a long period of time and are free of side effects such as hypoglycemia, kidney disease, GIT problems, hepatotoxicity, heart risk problems, and insulinoma. Not. For the rest of my life. Various Chinese herbs have also been shown to be effective in treating diabetes due to the beneficial ingredients of treatment diabetes.

Insulin secretion [2]. It is estimated that 366 million people had DM in 2011; by 2030 this would have risen to 552 million [3]. People living with type 2 DM are more vulnerable to various forms of both short- and long-term complications, which often lead to their premature death. This tendency of increased morbidity and mortality is seen in patients with type 2 DM because of the commonness of this type of DM, its insidious onset and late recognition, especially in resource-poor developing countries like Africa.[4]. Various types of hypoglycemic agents such as biguanides and sulfonylureas can also be used to treat diabetes. However, none of these drugs are ideal due to their toxic side effects, and long-term use may result in a reduction in response [5]. Type 2 DM (formerly known as non-insulin dependent DM) is the most common form of DM characterized by hyperglycemia, insulin resistance, and relative insulin deficiency[6]. Medicinal plants and their bioactive ingredients can be used to treat DM worldwide, especially in country , where access to conventional anti-DM drugs is inadequate. Various experimental models are also available to study the anti-diabetic activity of plants [7]. Therefore, the current review is an attempt to learn more about diabetes mellitus, its clinical manifestations, epidemiological data of , complications of , and currently available treatments for diabetes.



**Epidemiology in DM:** It is estimated that 366 million people had DM in 2011. By 2030 it will be 552 million. The number of people with type 2 diabetes is increasing in all countries where 80% of DM patients live Low and middle income countries. DM killed 4.6 million people in 2011. [8] Estimated 439 By 2030, millions of people will have type 2 diabetes. Incidence of type 2 diabetes varies significantly from geographic region to region as a result of environmental and lifestyle risk factors [9]. The prevalence of DM in adults with type 2 diabetes is projected to increase compared to the following , with the majority of the patients aged 45 to 45 years. Occurs in developing countries in between. And he is 64 years old [10]. **Diabetes in Indian population:** It is estimated that 366 million people had DM in 2011. By 2030 it will be 552 million. The number of people with type 2 diabetes is increasing in all countries where 80% of DM patients live Low and middle income countries. DM killed 4.6 million people in 2011. [8] Estimated 439 By 2030, millions of people will have type 2 diabetes. Incidence of type 2 diabetes varies significantly from geographic region to region as a result of environmental and lifestyle risk factors [9]. The prevalence of DM in adults with type 2 diabetes is projected to increase compared to the following , with the majority of the patients aged 45 to 45 years. Occurs in developing countries in between. And he is 64 years old [10].

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[11]. Diabetes is fast gaining the status of a potential epidemic in India with more than 62 million diabetic individuals currently diagnosed with the disease [12,13]. In 2000, India (31.7 million) topped the world with the highest number of people with diabetes mellitus followed by China (20.8 million) with the United States (17.7 million) in second and third place respectively. According to Wild et al. the prevalence of diabetes is predicted to double globally from 171 million in 2000 to 366 million in 2030 with a maximum increase in India. It is predicted that by 2030 diabetes mellitus may afflict up to 79.4 million individuals in India, while China (42.3 million) and the United States (30.3 million) will also see significant increases in those affected by the disease[10,14]

**Pathophysiology of DM:** Type 2 diabetes is characterized by insulin resistance, decreased insulin production, and insulin insensitivity due to ultimate pancreatic beta-cell damage. This leads to a reduction in glucose transport Liver, muscle cells, fat cells. In hyperglycaemia, fat breakdown increases [15,16]. People with type 1 diabetes are usually young (children or adolescents) and are not obese when they first develop symptoms. There is a genetic predisposition with a 10-fold increased incidence of in the proband first-degree relative and a strong association with a specific histocompatibility complex (HLA type). .. Studies of the same twins show that individuals with a genetic predisposition must also be exposed to environmental factors such as viral infections. Viral infections can damage pancreatic B cells and expose antigens that initiate a self-permanent autoimmune process. Patient is clearly diabetic with only if more than 90% of the B cells are destroyed. In this type, insulin deficiency weakens long-term potentiation and can lead to learning and memory impairment. Type 2 diabetes is associated with both insulin resistance and impaired insulin secretion, both of which are important in its pathogenesis. Such patients are often obese, usually present in adulthood, and their incidence gradually increases with age as B cell function declines. Insulin resistance causes both the formation of A $\beta$  plaque and the hyperphosphorylation of tau. During hyperinsulinemia, insulin and A $\beta$  compete for insulin degrading enzymes, leading to A $\beta$  accumulation and plaque formation. Decreased insulin receptor signalling causes inhibition of Akt and dephosphorylation (activation) of GSK3 $\beta$ , leading to hyperphosphorylation of tau [17,18].

**Complications:** As the disease progresses, tissue or blood vessel damage occurs, causing serious diabetic complications such as: B. Retinopathy, neuropathy, nephropathy, cardiovascular complications and ulcers. Long-standing type 1DM patients who are prone to microvascular complications. and macrovascular disease (coronary, cardiac and peripheral vascular disease) [19,20].

**Diagnosis:** According to the American Diabetes Association (ADA), fasting blood glucose should be used Regular screening for diabetes; postprandial blood glucose, accidental blood glucose, and glucose tolerance test are also used to measure blood glucose. At least one criterion should be applied to diagnose diabetes. -Diabetes symptoms (polyuria, polydipsia, unexplained weight loss, etc.), and occasional plasma glucose levels = 11.1 mmol / L (200 mg / dL). - Fasting Plasma Glucose = Its normal range is 70-110 mg / dl and there is no calorie intake for at least 8 hours. The World Health Organization (WHO) classification includes both clinical stages (normal blood glucose). ADA except that impaired glucose tolerance / fasting glycemic disorder (IGT / IFG), diabetes) and pathogenic type diabetes, the WHO group includes pregnancy glucose intolerance (GIGT) and pre-GDM classification. Same as: Fasting blood

glucose = 7.0 mmol / L (126 mg / dL) and / or 2-hour blood glucose after 75 go GTT = 7.8 mmol / L (140 mg / dL) [28]

**Management OF DM:** Diabetes mellitus is a chronic disease, for which there is no known cure except in very specific situations. Management concentrates on keeping blood sugar levels as close to normal ("euglycemia") as possible, without causing hypoglycemia. This can usually be accomplished with diet, exercise, and use of appropriate medications (insulin in the case of type 1 diabetes; oral medications, as well as possibly insulin, in type 2 diabetes). Learning about the disease and actively participating in the treatment is vital for people with diabetes, since the complications of diabetes are far less common and less severe in people who have well-managed blood sugar levels. The goal of treatment is an HbA1C level of 6.5%, but should not be lower than that, and may be set higher. Attention is also paid to other health problems that may accelerate the deleterious effects of diabetes. These include smoking, elevated cholesterol levels, obesity, high blood pressure, and lack of regular exercise. Specialised footwear is widely used to reduce the risk of ulceration, or reulceration, in at - -risk diabetic feet. Evidence for the efficacy of this remains equivocal, however [27]

**Medication:** Suggesting that majority of type 2 DM can be prevented by lifestyle modification. Patients with type 2 DM should receive a medical nutrition evaluation; lifestyle recommendations should be tailored according to physical and functional ability [26]. Metformin is generally recommended as a first line treatment for type 2 diabetes, as there is good evidence that it decreases mortality. Routine use of aspirin, however, has not been found to improve outcomes in uncomplicated diabetes. [56] Angiotensin converting enzyme inhibitors (ACEIs) improve outcomes in those with DM while the similar medications angiotensin receptor blockers (ARBs) do not. Type 1 diabetes is typically treated with a combination of regular and NPH insulin, or synthetic insulin analogs. When insulin is used in type 2 diabetes, a long-acting formulation is usually added initially, while continuing oral medications. Doses of insulin are then increased to effect. In those with diabetes some recommend blood pressure levels below 120/80 mmHg; however, evidence only supports less than or equal to somewhere between 140/90 mmHg to 160/100 mmHg [29]

**Conclusion:** The term diabetes includes several different metabolic disorders, all of which, if left untreated, result in abnormally high blood levels of a sugar called glucose. Type 1 diabetes develops when the pancreas stops producing a significant amount of the hormone insulin. This is usually due to the autoimmune destruction of insulin-producing beta cells in the pancreas. Type 2 diabetes, on the other hand, is currently believed to be the result of autoimmune attacks on the pancreas and / or insulin resistance. The pancreas in people with type 2 diabetes can produce normally or abnormally large amounts of insulin. The main goal of diabetes management is to restore the metabolism of carbohydrate as normal as possible. To achieve this goal, people with absolute insulin deficiency require insulin replacement therapy given by injection or tablets. In contrast, insulin resistance can be corrected by dietary changes and exercise. An additional goal of diabetes management is the prevention or treatment of the disease itself and many complications that may result from its treatment. By controlling blood sugar levels, diabetes can be a companion to the patient and the patient can enjoy a Happy life.

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