

A Review On Diabetes Mellitus: Treatment And Complication

Akshada Darekar¹, Bhakti Thorat², Sanishwar Darekar³, Santosh Waghmare⁴, Dr. H.V Kamble⁵

^{1,2}Dept of pharmaceutical chemistry

⁵Dept of pharmacology

^{1,2,3,4,5}Loknete Shree Dadapatil Pharate College of Pharmacy, Mandavgan Pharata.

Loknete Shree Dadapatil Pharate College of Pharmacy,

Mandavgan Pharata. Tal- Shirur , Dist-Pune.

Abstract- *Diabetes mellitus (DM), belongs to the class of metabolic diseases which the main symptom associated with this disease is the high sugar levels in blood for a long period. It can be categorized to the world's major diseases considering that affects high population in earth and presents two main types I and II. Diabetes complications in-cluded possible blindness, amputation of lower limb, renal failure, and cardiac arrest. Insulin therapy for diabetes is most commonly delivered via subcutaneous injections, up to fourtimes a day. Long-term insulin therapy, compounded by the invasive nature of its administration, has caused problems with patient compliance, ultimately influencing patient outcomes. There is an increase in the prevalence of type I diabetes also, but main cause of diabetic epidemics type 2 diabetes mellitus, which accounts for more than 90 percent of all diabetes cases. This review is an update on unknown complications, causes, and treatment modalities of this disease.*

Keywords- Diabetes mellitus, diagnosis, cause, treatment, complication.

I. INTRODUCTION

Diabetes is a lifelong (chronic) disease and is a group of metabolic disorders characterized by high levels of sugar in blood (hyperglycaemia). More than 230 million people worldwide are affected, and it is expected to reach 350 million by 2025. Globally the affected people are unaware of the disease and only half receive adequate treatment. It is caused due to deficiency of insulin or resistance to insulin or both. Insulin and glucagon hormones both are secreted by the pancreas. Insulin is secreted by the beta (β) cells and glucagon is secreted by the alpha (α) cells both are located in the islets of Langerhans's. Insulin decreases the blood glucose level by the glycogenesis and transport glucose into the muscles, liver and adipose tissue. Neural tissue and erythrocytes do not required insulin for glucose utilization whereas alpha (α) cells plays an important role in controlling blood glucose by producing the glucagon and it

increases the blood glucose level by accelerating the glycogenesis.

II. CLASIFICATION

1. Insulin Dependent Diabetes Mellitus (Type1 IDDM)

This type of diabetes mellitus is also called autoimmune diabetes and previously known as juvenile-onset or ketosis-prone diabetes. The individual may also seek with other autoimmune disorders such as Graves' disease, Hashimoto's thyroiditis, and Addison's disease. Type I diabetes mellitus is also known as insulin- dependent diabetes mellitus (IDDM), this occurs mainly in children and young adults; the onset is usually sudden and can be life threatening. Type 1 is usually characterized by the presence of anti-glutamic acid decarboxylase, islet cell or insulin antibodies which identify the autoimmune processes which leads to beta-cell destruction. Type 1 diabetes (due to the destruction of b-cell which is usually leading to absolute insulin deficiency). The rate of destruction of beta-cell is quite variable; it can be occur rapidly in some individuals and slow in others. There is a severe deficiency or absence of insulin secretion due to destruction of β -islets cells of the pancreas. Treatment with injections of insulin is required. Markers of immune destruction, including islet cell auto-antibodies, and/or auto antibodies to insulin, and auto antibodies to glutamic acid decarboxylase (GAD) are present in 85-90 % of individuals with Type 1 diabetes mellitus when fasting diabetic hyperglycaemia is initially detected.

2. Non-Insulin Dependent Diabetes Mellitus (Type2 Nidd)

Type 2 diabetes mellitus is also known as adult-onset diabetes. The progressive insulin secretary defect on the background of insulin resistance. 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, such patients are at increased risk of developing macro vascular and micro vascular complication.

3. Gestational Diabetes Mellitus

The glucose intolerance occurring for the first time or diagnosed during pregnancy is referred to as gestational diabetes mellitus (GDM). Women who develop Type 1 diabetes mellitus during pregnancy and women with undiagnosed asymptomatic Type 2 diabetes mellitus that is discovered during pregnancy are classified with Gestational Diabetes Mellitus (GDM). Gestational diabetes mellitus (GDM) (diabetes diagnosed during pregnancy that is not clearly over diabetes).

4. Other Specific Type (Monogenic Types)

The most common form of monogenic types of diabetes is developed with mutations on chromosome 12 in a hepatic transcription factor referred to as hepatocyte nuclear factor (HNF)-1a. They also referred to as genetic defects of beta cells. These forms of diabetes are frequently characterized by onset of hyperglycaemia at an early age (generally before age of 25 years). They are also referred to as maturity onset diabetes of the young (MODY) or maturity-onset diabetes in youth or with defects of insulin action; persons with diseases of the exocrine pancreas, such as pancreatitis or cystic fibrosis; persons with dysfunction associated with other endocrinopathies (e.g. acromegaly); and persons with pancreatic dysfunction caused by drugs, chemicals or infections.

CAUSES OF DIABETES MELLITUS

It is indicated by the study conducted by that Obesity and diabetes are major causes of morbidity and mortality in the United States. Obesity and weight gain, both are associated with an increased risk of diabetes among the people. The impairment of pancreatic β cell function notably show progression over time in type 2 diabetes. Although aging, Obesity, insufficient energy consumption smoking, etc are independent risk factors of the pathogenesis of type 2 diabetes mellitus. Over eating, Smoking, increase in alcohol intake, disorders of nervous and endocrine systems, increase in cortisol, abnormality in sex hormone secretion, and lowered energy consumption due to a lack of exercise and Genetic factors such as aging can cause diabetes mellitus (DM).

DIAGNOSIS OF DIABETES MELLITUS

The diagnosis of diabetes in an asymptomatic subject should never be made on the basis of a single abnormal blood glucose value. If a diagnosis of diabetes is made, the clinician must feel confident that the diagnosis is fully established since the consequences for the individual are considerable and lifelong. The diagnosis of diabetes mellitus include, urine sugar, blood sugar, glucose tolerance test, renal threshold of glucose, diminished glucose tolerance, increased glucose tolerance, renal glycosuria, extended glucose tolerance curve, cortisone stressed glucose tolerance test, intravenous glucose tolerance test, oral glucose tolerance test.

TREATMENT OF DIABETES MELLITUS

The treatment is to overcome the precipitating cause and to give high doses of regular insulin. The insulin requirement comes back to normal once the condition has been controlled the aims of management of diabetes mellitus can be achieved by:

1. To restore the disturbed metabolism of the diabetic as nearly too normal as is consistent with comfort and safety.
2. To prevent or delay progression of the short and long term hazards of the disease.
3. To provide the patient with knowledge, motivation and means to undertake this own enlightened care.

A. Types of Therapy Involved In Diabetes Mellitus

1. Stem cell therapy

Researchers have shown that monocytes/ macrophages may be main players which contribute to these chronic inflammations and insulin resistance in T2DM patient. Stem cell educator therapy, a novel technology, is designed to control or reverse immune dysfunction.

2. Antioxidant therapy

A variety of antioxidants, such as vitamins, supplements, plant-derived active substances and drugs with antioxidant effects, have been used for oxidative stress treatment in T2DM patients. Vitamin C, vitamin E and β carotene are ideal supplements against oxidative stress and its complications.

3. Anti-inflammatory treatment

The changes indicate that inflammation plays a pivotal role in the pathogenesis of T2DM and its complications. In T2DM, especially in adipose tissue,

pancreatic islets, the liver, the vasculature and circulating leukocytes.

B. Dietary Management Adequate caloric value Dietary management should be taken properly by the both diabetic and non-diabetic patient such as:

1. Balanced in regard to protein, carbohydrate and fats, in all cases it is necessary to restrict carbohydrate intake.
2. Should conform as closely as possible to normal
3. Food intake should be divided into regularly spaced meals of similar size
4. Reduce total calorie intake by decreasing both fat and carbohydrate
5. Patient must be advised to be constant in his dietary habits from day to day.

C. Newer Insulin Delivery Devices

A number of innovations have been made to improve ease and accuracy of insulin administration as well as to achieve tight glycaemia control. These are insulin syringes, pen devices, inhaled insulin, insulin pumps, implantable pumps, other routes of insulin delivery.

D. Oral Hypoglycaemic or Antidiabetic Agents

Clinically useful guanidyl phenformin was produced parallel to sulfonylureasins in 1957. Newer approaches have constantly been explored and have lately yielded thiazolidinedione's, meglitinide analogues, α -glucosidase inhibitors, and the latest are dipeptidyl peptidase-4 (DPP-4) inhibitors.

COMPLICATION OF DIABETES MELLITUS

Elevated glucose level for a long time, causes serious complications such as dysfunction, and failure of different organs, especially the eyes, kidneys, nerves, heart, and blood vessels etc. Long term or irreversible complication due to diabetes mellitus is abnormality in eyes with complete loss of vision, impaired functioning of the kidney, and nerve damage of peripheral region with end organ damage, abnormality in the autonomic nervous system causing abnormal functioning of gastro-intestinal tract, urinary tract and also cardiovascular system. A patient infected with diabetes are also at increased risk of atherosclerotic cardiovascular, peripheral arterial, and cerebrovascular disease. Hypertension and abnormalities of lipo-protein metabolism are often found in people with diabetes. According to life expectancy may decrease among the people of diabetes. Due to diabetes, many of our generation lead to death every year. Diabetes may cause

different health problems such as disorders of the eyes, kidneys, nerves, and circulatory system.

III. CONCLUSION

Diabetes mellitus a metabolic disease and its complication have aware the clinicians in all over the countries. In current status, a high number of populations have this disease which is related with the modern life style, unhealthy diet and sedentary life. The lifestyle and day today circumstances are play major role in occurring this type of serious complications. In this review we get some idea regarding diabetes mellitus.

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