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Review Article……!!!

DIABETES MELLITUS: A MAJOR CONCERN OF MODERN LIFESTYLE

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ABSTRACT

Diabetes mellitus (DM) is an array of metabolic diseases that result in high blood sugar level. It might be due to either insufficient insulin production by the body, or insulin resistance. DM has been divided into four types: Type 1 or Insulin-dependent DM; Type 2 or Non insulin-dependent DM; third type is gestational diabetes and another type is monogenic diabetes. Presently existing pharmacotherapy for the treatment of DM includes oral hypoglycemic agents and insulin. However, these drugs are not able to restore the normal glucose balance for sufficient period of time and moreover they have various side effects like, GIT problems, heart risk problems, hypoglycemia, insulinoma, kidney diseases, hepatotoxicity and they have to be taken for the rest of life. This review is an attempt to focus on the classification, symptoms, complications and goals of management and treatment of diabetes mellitus.

INTRODUCTION

Diabetes (Diabetes mellitus, DM) is a disease which results due to decreased insulin production, insulin action, or both. Deficient insulin level in blood results in chronic hyperglycemia with instability of carbohydrate, protein and fat metabolism. The progression of the disease can lead to severe complications like neuropathy, ulceration, retinopathy, cardiovascular complications and nephropathy. Thus, diabetes encompasses a wide range of heterogeneous diseases. [1] In short, we can say that diabetes is a disease, which cannot be cured but can be controlled. It is important to recognize the signs and symptoms to get early medical help. Globally, the occurrence of diabetes is rising quickly and according to the World Health Organization (WHO) (2003) predictions, there will be at least 350 million people in the world with type 2 diabetes by the year 2030. [2]

The terms *"Diabetes"* and *"Mellitus"* are derived from two Greek words: *"Diabetes"* - a passer through a siphon and *"Mellitus"* - sweet. The name was based on the thought that the high amounts of urine produced by diabetic people attracted bees and flies. In ancient Chinese, diabetes was diagnosed by a traditional way based on the attraction of ants to a person's urine. [3] In medieval period, the European doctors used to diagnose diabetes by themselves tasting the urine, a scene infrequently illustrated in Gothic beliefs. [4]

Higher blood glucose level or hyperglycaemia and lower blood glucose or hypoglycaemia are serious and potentially life threatening conditions. The difference between hyperglycaemia and hypoglycaemia are tabulated in Table 1.

TABLE 1:DIFFERENCE BETWEEN HYPERGLYCAEMIA AND HYPOGLYCAEMIA [5]

Hyperglycaemia	Hypoglycaemia
• Increased thirst and urination.	• Sweaty, cold clammy skin
• Weakness	• Double or blurred vision
• Nausea and vomiting	• Shallow breathing
• Aches and pains	• Headache
• Increased blood glucose levels	• Weak or dizzy

In 1965 WHO was put forward the criteria for the classification and diagnosis of diabetes and then in 1979 by the National Diabetes Data Group NDDG and in 1980 these recommendation were simplified by the WHO. In 1985 slight modifications were made in these recommendations. The American Diabetes Association published these recommendations in 1997 followed by the World Health Organization in 1999. According to the recommendation changes in the concentration of fasting glucose should be used in epidemiological studies as well as routine screening; the threshold for fasting glucose was changed from 7.8 mmol/L (140 mg/dl) to 7.0

mmol/L (126 mg/dl); however there was no change in the 2-h glucose criterion which remains as 11.1 mmol/L (200 mg/dL). [6-7] The universally accepted symbol of diabetes is shown in Figure 1.
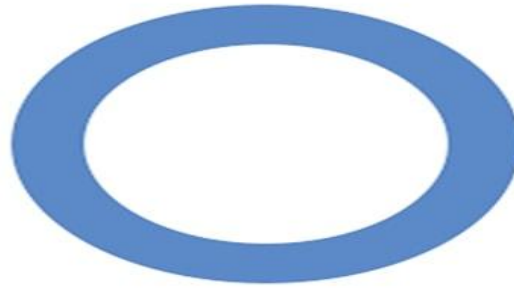
Figure 1: Universal symbol of DM [7]

Classification of DM

A better way to classify diabetes often depends on consolidation of etiological views concerning diabetes. The old classification of diabetes as given by WHO in 1980 and 1985 (where diabetes has been classified as insulin-dependent DM or non-insulin-dependent DM) have disappeared and the according to the new system of classification diabetes is classified into four types: Type 1 diabetes, Type 2 diabetes, Gestational diabetes and other specific types. [8]

Type 1 DM

Type 1 DM or Insulin Dependent Diabetes Mellitus is also known as juvenile diabetes and it is caused by the destruction of beta cells (that make insulin) of pancreas by the immune system, which leads to absolute deficiency of insulin. Type 1 DM account for about 10% of all of the cases of diabetes. A strong association has been found from various databases between type 1 diabetes and other endocrine autoimmune diseases like Addison disease and the occurrence of autoimmune diseases are more in the family members of type 1 DM. [9]

Type 2 DM

Type 2 DM is also known as Non-Insulin Dependent Diabetes Mellitus (NIDDM). Here the cells are unable to use insulin properly. Another name for Type 2 DM is adult onset diabetes mellitus and account for about eighty to ninety percent of all cases of diabetes. The majority of the patients with NIDDM exhibit visceral obesity (intra-abdominal), which is very closely related to the presence of insulin resistance. Moreover, dyslipidemia and hypertension are often present in Type 2 DM patients. It is the most common form of diabetes and is related with a family history of diabetes, lack of exercise, older age and obesity. Occurrence of type 2 DM is relatively common in women with a history of gestational diabetes, and in Native Americans, Hispanics, and Blacks. [7]

Gestational DM

This type of diabetes is generally observed during pregnancy. As there is a high circulation of blood glucose from placenta to fetus. Usually this type of diabetes resolves itself after pregnancy. This increases the risk of mother to develop the type 2 diabetes later in her life. It may develop from few weeks to months or years after pregnancy. In such type of cases there is more risk of development of diabetes in the fetus than the mother. [10]

The risk factor for the mother includes;

- Need for caesarean section due to overly large baby
- Damages heart, eyes and kidneys.

The risk factors for the baby include;

- Breathe problem at birth.
- Obesity.
- Abnormally increased weight before birth.

Symptoms and Signs of DM [11]

The symptoms and signs of DM are as follows:

- Frequent thirst, hunger and urination,
- Weight loss,
- Itchiness,
- Blurred vision,
- Recurrent vaginal infection,
- Peripheral neuropathy,
- Fatigue,
- Hyper ventilation,
- Feeling of distress,
- Nausea,
- Vomiting,
- Infection of Bladder,
- Abdominal pain,
- Wound that won't heal
- Tingling or numb feet or hands
- Excessive glucose may also leads to coma,

The symptoms are quicker to appear in type 1 than in type 2 diabetes. The symptoms are quite similar in both the types but they differ in their intensity (Ozougwu *et al.,* 2013). The clinical classifications of patients with Type 1 and Type 2 DM are listed in Table 2).

TABLE 2: CLINICAL CHARACTERISTICS OF PATIENTS WITH TYPE 1 AND TYPE 2 DM [12]

Features	Type 1	Type 2
Age of onset	> 20 years	< 30 years
Plasma insulin level	Low or absent	Normal to high initially
Body mass	Low (wasted) to normal	Obese
Plasma glucose level	Increased	Increased
Plasma glucagon level	High, can be suppressed	High, resistant to suppression
Insulin sensitivity	Normal	Reduced
Therapy	insulin	Weight loss, metformin, thiazolidinediones, insulin, sulfonylureas

Complications [13]

If poorly controlled, diabetes can cause damage to blood vessels and nerves and lead to problems with

- Eyesight
- Feet
- Liver and Kidney
- Ability to fight disease
- Heart and blood flow

Management [14]

Keeping the blood glucose within safe levels may involve some changes to your lifestyle.

- Oral hypoglycemic drugs (OHD).
- Dietary treatment.
- Insulin.
- Exercise/Workout.

Newer invention in DM [15]

- Insulin inhaler
- Implantable insulin.
- Artificial pancreas.

- Gastric stimulator.
- Dissolving hypodermic needle
- Breath test
- Laproscopic surgery

CONCLUSION

This review concludes that despite of the existence of so many treatments, diabetes mellitus is still not curable. The foremost aim of the management of diabetes is, to restore carbohydrate metabolism to a normal state as far as possible. By keeping the blood sugar level under control, diabetes can become patient's companion. Many newer inventions are available for the diagnosis and treatment of this disease. Changes in lifestyle will certainly play a very significant role in the management of diabetes and ideal solutions will depend to a large extent on the ability of basic science to provide new directions in the prevention and treatment of the disease.

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