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IN INDIA, DIABETES MELLITUS IS ON THE RISE AT AN ALARMING RATE: A REVIEW

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ABSTRACT
The aim of the current review is to acquaint all the covering aspect of dibetes mellitus which can provide awareness to the diabetes patients in india as well as all over the world. The number of diabetic patients in india is increasing at an alarming rate and is therefore a major area for concern. As per the WHO, the diabetes is expected to reach 79.4 million by 2030. The studies have shown that the type II diabetes is 4-6 times higher in urban than in rural areas in india. Development of diabetes among indians is due to several factors such as age (Based on NHANES data),waist circumference, hypertention, BMI, smoking habit and total cholestero these variables are important for comparing diabetic and non-diabetic patients

INTRODUCTION

Diabetes mellitus is probably one of the oldest diseases known to man. It was first reported in Egyptian manuscript about 3000 years ago [1]. The diabetes is derived from Greek word i.e. ‘Siphon’ (to pass through) and the term Mellitus was added to diabetes in 1675 by Thomas. The mellitus word was derived from Latin term i.e. honeyed or sweet [2]. Diabetes mellitus is a metabolic illness caused by abnormalities in insulin secretion, insulin action, or both. It is characterized by persistent hyperglycemia and problems in carbohydrate, lipid, and protein metabolism.[3][4]. In India, the diabetes is commonly known as ‘Madhumeha’(honey urine) because it attracts ants[5].

CLASSIFICATION

Type 1 diabetes is assumed to be caused by the loss of insulin-producing pancreatic cells that is immune-mediated, if not directly immune-mediated. Insulin pumps and continuous glucose monitors have improved, making it easier for patients with type 1 diabetes to manage the burden of lifetime insulin administration [6][7]. Type 2 diabetes mellitus (T2DM) is a global epidemic associated with increased health expenditure, and low quality of life. Many non-genetic risk factors have been suggested, but their overall epidemiological credibility has not been assessed [8]. Type 3 diabetes” accurately reflects the fact that AD represents a form of diabetes that selectively involves

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the brain and has molecular and biochemical features that overlap with both type 1 diabetes mellitus and T2DM [9][10]. Type 4 DM may be a new term that is still not standard. Nevertheless, type 4 DM is likely to exist and it might be under recognized. It has been found in the ongoing research that this type of diabetes is completely different from the one accompanied by the high blood glucose levels [11].

EPIDEMIOLOGY

Several facts contribute to augmented diabetes epidemic, such as “normal-weight metabolically obese” phenotype; high intake of refined carbohydrates; excess consumption of alcohol and extensive smoking and frequent reduction of physical activities or exercise Underprivileged nutrition in utero as well as in initial life collective with over nutrition in later life may correspondingly play a role in diabetes epidemic[12][13].The Identification of the cause of disease and the possible preventive measures that could be instituted to arrest or delay the onset of this disease which has reached epidemic proportions in both the developed and the developing nations. Unfortunately, the improvement in outcomes for individual patients with diabetes has not resulted in similar improvements from the public health perspective [14][15].

PATHOPHYSIOLOGY

When Banting, Best, Collip, and Macleod used a chemical isolated from bovine pancreas to successfully reduce blood glucose levels and glycosuria in a patient in the 1920s. Clinical data in the mid-1930s, however, showed a possible differentiation between insulin-sensitive and insulin-insensitive diabetes. It wasn't until the 1950s, when a reliable measure of circulating insulin became available, that these clinical observations could be translated into pathophysiological and biochemical distinctions. The next 30 years were marked by significant advances in immunology, which were crucial in revealing an immune-mediated loss of insulin-secreting -cells in patients with ‘insulin-dependent' diabetes, as well as novel experimental techniques for measuring insulin ‘impedance' showed a Insulin's peripheral action was diminished in non-insulin-dependent diabetes patients (insulin resistance).

The distinction between the two forms of diabetes was formally recognized in 1979, when the labels "type I" and "type II" diabetes were used to replace the words "insulin-dependent" and "non-insulin-dependent.’’[16][17][18].

The key pathophysiological hallmarks of type 2 diabetes, impaired insulin production and increased insulin resistance, work together to promote the disease's progression. Various environmental factors, added to these genetic factors, are considered responsible for the onset of disease, and the number of patients is increasing rapidly reflecting recent lifestyle changes. Impaired insulin secretion is characterized by lowered glucose responsiveness. Lowered glucose response is a symptom of impaired insulin secretion. The decrease in postprandial-phase secretion, in particular, is an important pathological condition [19][20].

RISK ASSESSMENT

The various factors influencing diabetes mellitus are genetic, pathophysiological, environment and lifestyle. The human leukocyte antigen (HLA) class II genes in chromosome 6, and more than 40 other than non-HLA genetic markers are being confirmed for the main susceptibility region for type I diabetes. Apart from type I diabetes the type II diabetes is a complex genetic disease along with strong environmental triggers, metabolic conditions which are all related to glucose intolerance resulting damage to insulin secretion.

Obesity is also considered a major factor for type II diabetes because overweight leads to higher cardiovascular risk. The diet of an individual also influence the optimal levels of blood glucose level. Sedentary lifestyle is considered the most prominent factors for type II diabetes. Physical activity gives positive effects on muscle growth, muscle glucose utilization, insulin liver sensitivity and overall glycemic control [21][22][23].

All types of diabetes mellitus have something in common. When you eat carbohydrates and sugars, they are converted into glucose. The cells in body are fueled by glucose. But the cells use glucose for energy and the cells need insulin, a hormone, in your bloodstream [24][25]. According to the International Diabetes Federation (IDF), the global population with diabetes between the ages of 20 and 79 was 285 million (6.4 percent) in 2010, and it is expected to rise to 439 million (7.7%) by 2030. According to the 6th edition of the Diabetes Atlas, there were 382 million diabetics in the globe in 2013, with that number expected to climb to 592 million (80 percent) by 2035[26][27]. Diabetes can only be regulated with various type of medicines along with exercise or yoga therapy or diet plan. Insulin

treatment is generally performed in type I diabetes mellitus and other oral hypoglycemic drug such as sulphonylureas, thiazolidinediones, peptide analogs are used for treatment of type II diabetes mellitus. According to world ethanobotanical 800 medicinal plants are used for the prevention of diabetes mellitus. However only 450 medicinal plants have been clinically proven to have anti diabetic property from which 109 medicinal plant have complete mode of action[28][29][30]. Age group (45–69 years), marital status, hypertension, obesity and family history of DM were found to be the risk factors significantly associated with DM in a multivariate regression model in Punjab, India [31][32]. Transdermal medication administration is gaining popularity these days due to its advantages over traditional oral dose forms. By 2025, the global transdermal medication delivery system market is expected to expand to around 95.57 billion dollars [33][34].

DIAGNOSIS

Diabetes mellitus is diagnosed using either the estimation of plasma glucose or HbA1C. The association of fasting plasma glucose of 126 mg/dL (7.0 mool/L), plasma glucose after 2 hours OGTT (oral glucose tolerance test) of 200 mg/dL (11.1 mool/L), HbA1C of 6.5 percent (48 mmol/mol), or a random plasma glucose of 200 mg/dL or 11.1 mmol/L) along with symtoms of hyperglycemia is diagnostic of diabetes mellitus [35][36].

TREATMENT USING HERBAL DRUGS

Diabetes mellitus is becoming a common metabolic disorder which has serious threat to public health in the world. There are chemicals and biochemical agent that helps in controlling diabetes but there is no permanent remedy available which helps to get recover are completely from this disorder [9]. Herbal medications and plants are utilized in the treatment of diabetes in India.

While there are several techniques to reducing the negative consequences of diabetes, herbal formulations are favored since they have less side effects and are less expensive. The following are the proven antidiabetic and herbal medications used in the treatment of diabetes. *Momordica charantia*, *Allium sativum*, *Eugenia jambolana Ocimum sanctum*, *Phyllanthus amarus*, *Pterocarpus marsupium*, *Tinospora cordifolia*, *Trigonella foenum graecum*, and *Withania somnifera* are some of the plants that grow in this area [37][38][39].

CONCLUSION

Despite the lack of concrete epidemiological evidence, it is both intellectually and medically valid to consider a historical reframing of diabetes in India. All diabetic patients should remember a simple strategy for preventing such type of chronic disorder and that is the Mantras regular exercise, less intake of food and avoid such ante food which can be harmful

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Nil

CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHOR CONTRIBUTION

Arnab Bagchi and Prosanta Pal designed the work and made necessary corrections and revisions in the manuscript. Arnab Bagchi collected the content and did literature review. He also contributed in drafting the manuscript. All the authors framed the final manuscript

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