

A REVIEW ON DIABETES MELLITUS

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ABSTRACT

Diabetes mellitus is a group of physiological dysfunction characterized by hyper-glycaemia. Now a days, diabetes mellitus has emerged as a significant global public health concern with a remarkable increase in its prevalence. Type 2 diabetes accounts for around 90% of cases, while type 1 diabetes accounts for most of the remainder. All forms of diabetes are ultimately a consequence of relative insulin deficiency. The purpose of this article is to review the basic science of type 2 diabetes and its complication.

KEYWORDS: Diabetes mellitus, Diagnosis, Cause and Treatment.

INTRODUCTION

All forms of Diabetes are ultimately a consequence of absolute or relative insulin deficiency. Although type 1 and type 2 diabetes share the clinical phenotype of hyperglycaemia and carry risks of similar complications, their aetiology and pathophysiology are very different. In type 1 diabetes, there is an absolute deficiency of insulin because of an immune-mediated destruction of insulin-producing cells in the pancreatic islets of Langerhans. In contrast, in type 2 diabetes, concentrations of circulating insulin are typically elevated, but there is relative deficiency of insulin because there is reduced sensitivity to insulin in peripheral tissues (due to obesity) and the cells cannot make sufficient insulin to overcome this insulin resistance. Diabetes carries a heavy personal burden for those affected as well as high financial costs to the health-care system and society at large. In 2017, diabetes caused 4 million deaths globally. Acutely, high glucose results in marked symptoms of thirst, polydipsia and polyuria. If left untreated, it can lead to life-threatening metabolic decompensation requiring hospitalisation, especially in type 1 diabetes. Type 2 Diabetes (formerly known as non-insulin dependent DM) is the most common form of DM characterized by hyperglycaemia, insulin resistance and relative insulin deficiency. Type 2 DM results from interaction between genetic, environmental and behavioural risk factors.

Epidemiology

The prevalence of diabetes is rising. Globally, it is estimated that 463 million people had diabetes in 2019 (9.3% of the world adult population), approximately 90% with type 2 diabetes. This figure is expected to reach 700 million by 2045. Prevalence is highest in the middle east and low east in parts of Africa, varying

around the world according to ethnicity as well as environmental factors (obesity, diet, habitual physical activity, urbanisation and economic development). A pronounced rise in the prevalence of type 2 diabetes occurs in migrant populations from low-income to industrialised countries. In many high-income countries, type 2 diabetes is no longer rare in children and adolescents, particularly in people of Hispanic, non-Hispanic Black and south Asian ethnicity. In some of these countries, increased survival is a factor underlying rising prevalence. Type 1 diabetes is also subject to geographical variation and is generally more prevalent in countries closer to the polar region. Finland, for instance, has the highest rate of type 1 diagnosis per year at >60 per 100,000 of the population, whereas in China, India and Venezuela the incidence is only 0.1 per 100,000. The incidence of type 1 diabetes is also increasing between 1989 and 2013, 3.4% more children were diagnosed worldwide each year.

Aetiology and pathogenesis of diabetes.

At a fundamental level, diabetes is a consequence of absolute or relative deficiency of insulin, although the underlying genes, precipitating environmental factors and pathophysiology differ substantially between the various forms. In type 1 diabetes and diabetes secondary to pancreatic pathology there is an absolute insulin deficiency that requires treatment with insulin. At the other end of the spectrum, mutations in the insulin receptor cause diabetes due to severe insulin resistance, such individuals have extremely high levels of insulin, but have a relative deficiency because insulin can not exert a functional effect via an abnormal receptor. In type 2 diabetes, there is usually a combination of both β cell dysfunction and insulin resistance.

Aetiological classification of diabetes mellitus

Type 1 diabetes

Type 2 diabetes

Other specific types

Genetic defects of β cell function

Genetic defects of insulin action

Pancreatic disease

Excess endogenous production of hormonal antagonists to insulin, i.e

Growth hormone-acromegally

Glucocorticoids-cushing's syndrome

Glucagon-glucagonoma

Catecholamines-pheochromocytoma

Thyroid hormone-thyrotoxicosis

Drug- induced

Associated with genetic syndrome, i.e Down syndrome, Klinefelter syndrome, Turner syndrome.

Gestational syndrome.

Factors associated with insulin resistance and insulin deficiency

Insulin resistance-Genetic factors (Single gene mutations, multiple gene variants)

Central obesity

Ethnicity

Reduced physical activity

Hormone excess

Drugs, e.g. glucocorticoids

Insulin deficiency-Genetic factors (Single gene mutation, multiple gene variants)

Increasing age

Autoimmune destruction

Pancreatic pathology

Toxins, e.g. alcohol, cytokines

Infections, e.g. SARS-CoV-2

Glucotoxicity

Lipotoxicity

Deposition of islet amyloid polypeptide

Symptoms of hyperglycaemia

Polyuria

Nocturia

Thirst, dry mouth

Polydipsia

Tiredness, fatigue, lethargy

Change in weight

Blurring of vision

Pruritus vulvae, balanitis (Genital candidiasis)

Nausea

Headache

Hyperphagia

Mood change, irritability, difficulty in concentrating, apathy.

Diagnosis of diabetes mellitus

The diagnosis of diabetes is an asymptomatic subject should never be made on the basis of a single abnormal blood glucose value. The diagnosis of diabetes mellitus include urine sugar, blood sugar, glucose tolerance test, renal threshold of glucose 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 to 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
2. Antioxidant therapy
3. Anti-inflammatory treatment

(B) Dietary Management

(C) Newer Insulin Delivery Devices

(D) Oral Hypoglycaemic or Anti diabetic Agents

CONCLUSION

Diabetes mellitus is a serious complication in today life. The lifestyle and day to day circumstances are play major role in occurring this type of serious complications. In this review we got some idea regarding diabetes mellitus.

REFERENCES

1. KD Tripathy. Essential Medicals Pharmacology, Jaypee Brothers Medical Publishers (p) LTD, 2013; 7: 258-281.
2. The world Health Report. Shaping the future, 2003.
3. American Diabetes Association, Diagnosis and classification of diabetes mellitus, Diabetes care, 2014; I.
4. Davidson's principles and practice of Medicine, 24: 704-716.