An Introduction to Diabetes

A.K Wilson†

Editorial

Diabetes mellitus is derived from the Greek words diabetes, which means "to pass through," and mellitus, which means "sweet." According to historical evidence, Apollonius of Memphis coined the name "diabetes" approximately 250 to 300 BC. The sweet flavour of urine in this ailment was discovered by ancient Greek, Indian, and Egyptian civilizations, and hence the term Diabetes Mellitus was coined. The involvement of the pancreas in the pathophysiology of diabetes was discovered by Mering and Minkowski in 1889. At the University of Toronto in 1922, Banting, Best, and Collip isolated the hormone insulin from the pancreas of cows, resulting in the availability of an efficient diabetic medication in 1922. Exceptional work has been done over the years, and many discoveries, as well as management solutions, have been developed to address this expanding problem. Unfortunately, diabetes remains one of the most common chronic diseases in the United States and around the world. It is still the seventh greatest cause of mortality in the United States.

Diabetes mellitus (DM) is a metabolic disorder characterised by abnormally high blood glucose levels. Type 1, type 2, maturity-onset diabetes of the young (MODY), gestational diabetes, neonatal diabetes, and secondary causes related to endocrinopathies, steroid usage, and other factors are all types of diabetes. Type 1 diabetes mellitus type 1 (T1DM) and Type 2 diabetes mellitus (T2DM) are the two most common kinds of diabetes, both of which are caused by faulty insulin secretion (T1DM) and/or action (T2DM) (T2DM). T1DM is expected to afflict children and adolescents, but T2DM is thought to affect middle-aged and older individuals who have long-term hyperglycemia as a result of poor lifestyle and nutritional choices. Because the pathogenesis of T1DM and T2DM is so dissimilar, each type has its own set of etiologies, manifestations, and therapies.

Treatment

Diabetes physiology and therapy are complicated, and good disease management necessitates a variety of therapies. Diabetic education and patient participation are essential in diabetes management. Patients who can control their diet (carbohydrate and overall calorie restriction), exercise regularly (greater than 150 minutes weekly), and monitor their glucose levels independently have better outcomes. Treatment may be required for the rest of one's life to avoid problems. Glucose levels should be kept between 90 and 130 mg/dL, and HbA1c should be less than 7%. While glucose control is crucial, overly aggressive treatment might result in hypoglycemia, which can have serious consequences or even be deadly.

Because T1DM is largely caused by a lack of insulin, the cornerstone of treatment is insulin administration by daily injections or an insulin pump. Diet and exercise may be sufficient therapies for T2DM, especially at first. Other treatments may aim to improve insulin sensitivity or boost pancreatic insulin output. Biguanides (metformin), sulfonylureas, meglitinides, alpha-glucosidase inhibitors, thiazolidinediones, glucagonlike-peptide-1 agonist, dipeptidyl peptidase IV inhibitors (DPP-4), selective, amylinomimetics, and sodium-glucose transporter-2 (SGLT-2) inhibitors are some of the particular subclasses. Metformin is a first-line diabetic drug that works by decreasing both basal

and postprandial plasma glucose levels. Insulin therapy may be required for T2DM patients, particularly those with poor glucose control in the latter stages of the disease. Bariatric surgery may be used to correct glucose levels in severely obese people. It is advised for people who have failed to respond to conventional treatments and have a lot of comorbidities. liraglutide and semaglutide, both GLP-1 agonists, have been linked to better cardiovascular outcomes. The SGLT-2 inhibitors empagliflozin and canagliflozin have also been found to enhance cardiovascular outcomes, as well as provide possible renoprotection and heart failure prevention.

Microvascular problems are a feared consequence of diabetes, hence regular testing are required. To assess for diabetic retinopathy, skilled medical personnel should perform regular diabetic retinal exams. Patients with neuropathy who are at risk for amputation can be identified with a neurologic examination and monofilament testing. Clinicians can also advise patients to conduct frequent foot checks to detect lesions that might otherwise go unreported due to neuropathy. To address neuropathic pain in diabetes, low-dose tricyclic antidepressants, duloxetine, anticonvulsants, topical capsaicin, and pain medicines may be required. Urine microalbumin testing, in combination with the estimated GFR, can detect early renal alterations from diabetes, such as albuminuria greater than 30mg/g creatinine. Angiotensin-converting enzyme (ACE) inhibitors and angiotensin receptor blockers (ARBs) are the preferred medications for delaying the transition of microalbuminuria to macroalbuminuria in patients with Type 1 and Type 2 diabetes.

Regular blood pressure screening is also recommended for diabetics, with a target of 130 mmHg systolic blood pressure and 85 mmHg diastolic blood pressure. Angiotensin-converting enzyme inhibitors, angiotensin receptor blockers, diuretics, beta-blockers, and/or calcium channel blockers are commonly used in the treatment of hypertensive diabetes. The American Diabetes Association (ADA) recommends lipid monitoring for diabetics, with a goal of LDL cholesterol (LDL-C) of less than 100 mg/dL in the absence of cardiovascular disease (CVD) and fewer than 70 mg/dL in the presence of atherosclerotic cardiovascular disease (ASCVD). Statins are the first-line treatment for diabetics who have dyslipidemia. Low-dose aspirin, according to the American Diabetes Association, may be advantageous for diabetic patients who are at high risk for cardiovascular events; however, the effect of aspirin in lowering cardiovascular events in diabetic individuals is unknown.