BMJ Best Practice

Overview of diabetes

Straight to the point of care

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Introduction

Diabetes is a general term for disorders characterised by polyuria. It usually refers to diabetes mellitus, a common chronic syndrome of impaired carbohydrate, protein, and fat metabolism owing to insufficient secretion of insulin and/or target-tissue insulin resistance. Complications of diabetes mellitus include both macrovascular (coronary heart, cerebrovascular, and peripheral vascular disease) and microvascular (retinopathy, nephropathy, and neuropathy) sequelae.

Diabetes insipidus (DI) is much less common and refers to disorders of vasopressin secretion (central DI) or action (nephrogenic DI), resulting in urinary concentrating abnormality.

Related conditions

◊ Type 2 diabetes mellitus in adults

» see our comprehensive coverage of Type 2 diabetes mellitus in adults (https://bestpractice.bmj.com/topics/en-gb/24)

Common disorder characterised by insulin resistance and relative insulin deficiency. Often people with type 2 diabetes mellitus are asymptomatic and it is detected on screening. Symptoms, when present, may indicate overt hyperglycaemia. Strong risk factors include older age, smoking, overweight/obesity, physical inactivity, prior gestational diabetes mellitus, pre-diabetes, non-white ancestry, family history of diabetes, or polycystic ovary syndrome.[1] [2]

◊ Type 1 diabetes mellitus

» see our comprehensive coverage of Type 1 diabetes mellitus (https://bestpractice.bmj.com/topics/en-gb/25)

Characterised by absolute insulin deficiency. Usually develops as a result of autoimmune pancreatic beta-cell destruction in genetically susceptible individuals.[3] Type 1 diabetes can be diagnosed at any age, but the highest incidence is in children aged 10-14 years.[3] Patients most often present with a few days or weeks of polyuria, polydipsia, weight loss, and weakness. Some patients may present with diabetic ketoacidosis.

◊ Type 2 diabetes in children

» see our comprehensive coverage of Type 2 diabetes in children (https://bestpractice.bmj.com/topics/en-gb/786)

Obesity, leading to insulin resistance, is the primary cause of type 2 diabetes in children. The incidence of type 2 diabetes in youths (age 10 to 19 years) is increasing.[4] Commonly accompanied by acanthosis nigricans (90% to 95% of patients).[5]

◊ Gestational diabetes mellitus (GDM)

» see our comprehensive coverage of Gestational diabetes mellitus (GDM) (https://bestpractice.bmj.com/topics/en-gb/665)

GDM develops during pregnancy and is diagnosed on the basis of elevated plasma glucose levels, although the precise diagnostic criteria remain controversial. Risk factors for GDM include advanced maternal age (>40 years), obesity, personal history of gestational diabetes or macrosomia of previous child, polycystic ovary syndrome, non-white ancestry, and family history of type 2 diabetes mellitus.[6] [7] The risk for recurrence of GDM in subsequent pregnancies or progression to type 2 diabetes is high.

◊ Diabetic ketoacidosis (DKA)

» see our comprehensive coverage of Diabetic ketoacidosis (DKA) (https://bestpractice.bmj.com/topics/en-gb/3000097)

DKA and hyperosmolar hyperglycaemic states are acute metabolic emergencies. DKA is characterised by the triad of hyperglycaemia, increased ketone concentration in the blood and/or urine, and metabolic acidosis.[8] DKA is more common in young people with type 1 diabetes but can occur at any age and with any type of diabetes.[8] Successful treatment includes correction of volume depletion, ketogenesis, hyperglycaemia, electrolyte imbalances, and comorbid precipitating events (e.g., infection), with frequent monitoring.

◊ Hyperosmolar hyperglycaemic state

» see our comprehensive coverage of Hyperosmolar hyperglycaemic state (https://bestpractice.bmj.com/topics/en-gb/3000124)

Severe hyperglycaemia, hyperosmolality, and volume depletion, in the absence of severe ketoacidosis or acidosis.[8] Occurs most commonly in older patients with type 2 diabetes with high mortality, but can occur at any age and with any type of diabetes.[8] Treatment includes correction of fluid deficit and electrolyte abnormalities, and intravenous insulin.

◊ Diabetic cardiovascular disease

» see our comprehensive coverage of Diabetic cardiovascular disease (https://bestpractice.bmj.com/topics/en-gb/533)

Cardiovascular disease (CVD) is the leading cause of death in people with diabetes. People with diabetes have up to a fourfold increased risk of stroke and are twice as likely to die after myocardial infarction than people without diabetes.[9] [10] Regular physical activity, medical nutrition therapy, and smoking cessation or non-initiation are important lifestyle changes for the primary prevention of CVD. Strong risk factors include poor glycaemic control, cigarette smoking, hypertension, dyslipidaemia, physical inactivity, albuminuria, C-reactive protein, and family history of CVD.

◊ Diabetic kidney disease

» see our comprehensive coverage of Diabetic kidney disease (https://bestpractice.bmj.com/topics/en-gb/530)

Defined by albuminuria (increased urinary albumin excretion is defined as ≥3.4 mg/mmol [30 mg/g]) and progressive estimated reduction in glomerular filtration rate (eGFR) in the setting of a long duration of diabetes (>10 years' duration of type 1 diabetes; may be present at diagnosis in type 2 diabetes), and is typically associated with retinopathy. Symptoms may be absent until the disease is advanced.

◊ Diabetic neuropathy

» see our comprehensive coverage of Diabetic neuropathy (https://bestpractice.bmj.com/topics/en-gb/531)

Diabetic neuropathy is a highly prevalent complication of diabetes (type 1 or type 2) and is characterised by the presence of symptoms and/or signs of peripheral nerve dysfunction and/or autonomic nerve dysfunction. Peripheral neuropathy may present as pain, loss of sensation, or painless ulcers on pressure points, although many patients are asymptomatic. In addition to symptoms associated with orthostatic hypotension, patients with autonomic neuropathy may present with nausea, vomiting, and early satiety (gastroparesis); difficulty in emptying the bladder (cystopathy); or erectile dysfunction.

◊ Diabetes-related foot disease

» see our comprehensive coverage of Diabetes-related foot disease (https://bestpractice.bmj.com/topics/en-gb/1213)

Diabetes-related foot disease, including ulcers and infections, is a common and costly complication of diabetes mellitus. Most diabetic foot ulcers are caused by repetitive trauma sustained during activity on a structurally abnormal, insensate foot. Ulcers act as a portal of entry for bacterial infections. Preventing and/or healing ulcers helps prevent infections and thereby minimises risk of limb loss. General practitioners and primary care nurses are generally on the front line of care for patients with diabetes. As such, they have a key role in preventing and identifying active diabetic foot problems.

◊ Diabetic retinopathy

» see our comprehensive coverage of Diabetic retinopathy (https://bestpractice.bmj.com/topics/en-gb/532)

The chronic progressive retinal manifestation of hyperglycaemic vascular damage and neurodegenerative change. It increases in prevalence with duration of diabetes. Sight-threatening signs include macular oedema, retinal or optic disc new vessels, and vitreous haemorrhage.

◊ Inpatient glycaemic management

» see our comprehensive coverage of Inpatient glycaemic management (https://bestpractice.bmj.com/topics/en-gb/1086)

Refers to identification and treatment of hyperglycaemia in the setting of acute illness in hospitalised patients with either pre-existing diabetes or new-onset hyperglycaemia. The development of hyperglycaemia during acute medical or surgical illness is not be a physiological or benign condition but rather a marker of poor clinical outcomes and increased mortality.[11]

◊ Metabolic syndrome

» see our comprehensive coverage of Metabolic syndrome (https://bestpractice.bmj.com/topics/en-gb/212)

Cluster of common abnormalities, including insulin resistance, impaired glucose tolerance, abdominal obesity, reduced high-density lipoprotein-cholesterol levels, elevated triglycerides, and hypertension.[12] [13] The main utility of diagnosing metabolic syndrome is the identification of people at high risk of cardiovascular disease beyond low-density lipoprotein-cholesterol levels. However, whether a diagnosis of metabolic syndrome provides more useful information than its individual components regarding cardiovascular risk is greatly controversial.

◊ Diabetes insipidus (DI)

» see our comprehensive coverage of Diabetes insipidus (DI) (https://bestpractice.bmj.com/topics/en-gb/288)

Characterised by polydipsia, polyuria, and formation of inappropriately hypotonic (dilute) urine. Central DI is due to defective synthesis or release of arginine vasopressin (AVP).[14] Nephrogenic DI is due to renal insensitivity to AVP.[15]

Key articles

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This approach is in line with the guidance of the International Bureau of Weights and Measures Service. https://www.bipm.org/en/about-us/

Figure 1 – BMJ Best Practice Numeral Style

5-digit numerals: 10,000

4-digit numerals: 1000

numerals < 1: 0.25

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