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المحاضرة 17- المرحلة الثانية الطب الباطني – تقنيات التخدير

Diabetes mellitus (DM)

Definition

- Diabetes mellitus is the most common of the endocrine disorders. •
- It is a chronic metabolic condition, characterized by hyper glycaemia •
due to impaired insulin production and secretion with or without
insulin resistance.
- Diabetes mellitus may be classified according to Aetiology, by far •
the most common types being type 1 and type 2 diabetes

Box 45.1 Aetiological classification of diabetes mellitus

Type 1

- β -Cell destruction, usually leading to absolute insulin deficiency
- Autoimmune
- Idiopathic

Type 2

- Ranges from mild to significant secretion of insulin deficiency, with or without insulin resistance

Other specific types

- Gestational diabetes
- Maturity onset diabetes of the young
- Genetic defects in β -cell function or insulin action
- Diseases of the exocrine pancreas (e.g. neoplasia, hereditary haemochromatosis, cystic fibrosis)
- Endocrinopathies (e.g. acromegaly, Cushing's)
- Drug or chemical induced (e.g. alcohol, glucocorticoid steroids, high-dose thiazides)

Type 1 diabetes

- Immune-mediated
- Idiopathic

Type 2 diabetes**Other specific types**

- Genetic defects of β -cell function (see Box 20.10)
- Genetic defects of insulin action (e.g. leprechaunism, lipodystrophies)
- Pancreatic disease (e.g. pancreatitis, pancreatectomy, neoplastic disease, cystic fibrosis, haemochromatosis, fibrocalculous pancreatopathy)
- Excess endogenous production of hormonal antagonists to insulin, e.g.:
 - Growth hormone – acromegaly
 - Glucocorticoids – Cushing's syndrome
 - Glucagon – glucagonoma
 - Catecholamines – phaeochromocytoma
 - Thyroid hormones – thyrotoxicosis
- Drug-induced (e.g. glucocorticoids, thiazide diuretics, phenytoin)
- Uncommon forms of immune-mediated diabetes (e.g. IPEX syndrome)
- Associated with genetic syndromes (e.g. Down's syndrome, Klinefelter's syndrome, Turner's syndrome, DIDMOAD (Wolfram's syndrome), Friedreich's ataxia, myotonic dystrophy)

Gestational diabetes

(DIDMOAD = diabetes insipidus, diabetes mellitus, optic atrophy, nerve deafness; IPEX = immunodysregulation polyendocrinopathy X)

Types of Diabetes mellitus •

□ **Type 1 diabetes** (3%) is a disease characterized by the destruction of the insulin-producing pancreatic β -cells. •

o In more than 90% of cases, β -cell destruction is associated with autoimmune disease. •

o Type 1 diabetes usually develops in children or young adults, •

although it can develop at any age and is associated with a faster onset of symptoms, leading to dependency on extrinsic insulin for survival. •

□ **Type 2 diabetes** : is more common (90%) and traditionally occurs in adults older than 40 years, with a peak onset between 60 and 70 years of age in developed countries. o It is caused by a relative insulin deficiency and the body's inability to effectively use insulin. •

i**20.12 Classical features of type 1 and type 2 diabetes**

	Type 1	Type 2
Typical age at onset	<40 years	>50 years
Duration of symptoms	Weeks	Months to years
Body weight	Normal or low	Obese
Ketonuria	Yes	No
Rapid death without treatment with insulin	Yes	No
Autoantibodies	Positive in 80–90%	Negative
Diabetic complications at diagnosis	No	25%
Family history of diabetes	Uncommon	Common
Other autoimmune disease	Common	Uncommon

Gestational diabetes is hyperglycemia that is detected during pregnancy. •
Overt symptoms of hyperglycemia are difficult to distinguish from normal symptoms of pregnancy.

❑ The risk of gestational diabetes should be assessed during early •
pregnancy for women with a body mass index (BMI) greater than 30
kg/m², a previous macrocosmic baby weighing 4.5 kg or greater.

❑ Secondary diabetes arises due to complications of other diseases, such •
as diseases of the pancreas or hormone disturbances such as in Cushing's
disease and acromegaly.

Two other varieties of non typical diabetes that may be seen are : •
latent autoimmune diabetes in adults (LADA) and maturity-onset •
diabetes of the young (MODY).

These have risk to development of type 2 DM and type 1 DM •
independently on age in the future .

Categories of increased risk for diabetes (prediabetes): Individuals •
who have elevated blood glucose levels that do not meet diagnostic
criteria for diabetes, but that are too high to be considered normal,
are classified as having prediabetes. Prediabetes is a high-risk
category for the future development of type 2DM.

Risk Factors for Type 2 Diabetes Mellitus⁸

Adults	Children ^a
Overweight (≥ 25 kg/m ²)	Overweight (BMI > 85th percentile for age and sex; or weight > 120% of ideal for height)
Family history of diabetes (first-degree relative)	Family history of diabetes (first- or second-degree relative)
Physical inactivity	
Ethnic predisposition ^b	Ethnic predisposition ^b
Previous IFG, IGT, or A1C $\geq 5.7\%$	
History of PCOS, GDM, or macrosomia	Maternal history of diabetes (including GDM)
Clinical conditions associated with insulin resistance (e.g., severe obesity and acanthosis nigricans)	Signs of insulin resistance (e.g., acanthosis nigricans)
Hypertension ($\geq 140/90$ mm Hg or on antihypertensive therapy)	Conditions associated with insulin resistance (e.g., hypertension, dyslipidemia, or PCOS)
Dyslipidemia	
HDL-C < 35 mg/dL (0.90 mmol/L)	
Triglyceride > 250 mg/dL (2.82 mmol/L)	
Cardiovascular disease	

Clinical presentation

TYPE 1 DM: •

Symptoms are severe and faster in onset. include polyuria and polydipsia, •
accompanied by fatigue and marked weight loss because of dehydration,
and the breakdown of body protein and fat as an alternative energy source
to glucose.

Blurred vision and may also experience higher infection rates, •
especially *Candida*, skin and urinary tract infections. •

In a significant proportion, the presenting symptoms are those of diabetic •
ketoacidosis (DKA): nausea, vomiting, abdominal pain, dehydration, and
shortness of breath ,and, in extreme cases, coma.

Without prompt treatment, DKA can be fatal •

Clinical presentations

Type 2 DM •

patients are often asymptomatic and may be diagnosed secondary to unrelated blood tests. •

Lethargy, polyuria, nocturia, and polydipsia can be present. Significant weight loss is less common; more often, patients are overweight or obese. •

Patients often present with complications for example, cardiovascular disease or renal disease. •

peripheral vascular disease (PVD) and infection may manifest as foot ulceration or gangrene •

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20.11 Symptoms of hyperglycaemia

- Thirst, dry mouth
- Polyuria
- Nocturia
- Tiredness, fatigue, lethargy
- Change in weight (usually weight loss)
- Blurring of vision
- Pruritus vulvae, balanitis (genital candidiasis)
- Nausea
- Headache
- Hyperphagia; predilection for sweet foods
- Mood change, irritability, difficulty in concentrating, apathy

Diagnosis

Criteria for diagnosis of diabetes mellitus include any one of the following: •

1. ***Glycated hemoglobin*** or ***hemoglobin A1c (HbA1c)*** of 6.5% or more •
2. ***Fasting plasma glucose*** of 126 mg/dL (7.0 mmol/L) or more. In this test, •
patient must avoid any caloric intake for at least 8 hours.
3. Two-hour plasma glucose of 200 mg/dL (11.1 mmol/L) or more during an •
oral glucose tolerance test (OGTT) using a glucose load containing the
equivalent of 75g anhydrous glucose dissolved in water.
4. ***Random plasma glucose*** concentration of 200 mg/dL (11.1 mmol/L) or •
more with classic symptoms of hyperglycemia or hyperglycemic crisis.

Classification	HbA1c values		Normal random glucose test results
	<i>WHO</i>	<i>ADA</i>	<i>ADA</i>
Non-diabetic	<6.0%	<5.7	80–140 mg/dl (4.4–7.8 mmol/l)
Prediabetes or Impaired glucose regulation (IGR)	6.0–6.4%	5.7–6.4%	140–200 mg/dl (7.8–11.1 mmol/l)
Type 2 diabetes	6.5% or more		≥ 200 mg/dl (≥11.1 mmol/l)

Screening:

Screening is not recommended for Type-I DM, but it is recommended •
for Type-II DM for adults over 45 years every 3 years.

It is also recommended that children over age 10 years and •
adolescents who, along with being overweight or obese, have at least
one additional diabetes risk factor be screened for prediabetes and
type 2 diabetes.

Major Complications of Diabetes

Microvascular

Eye

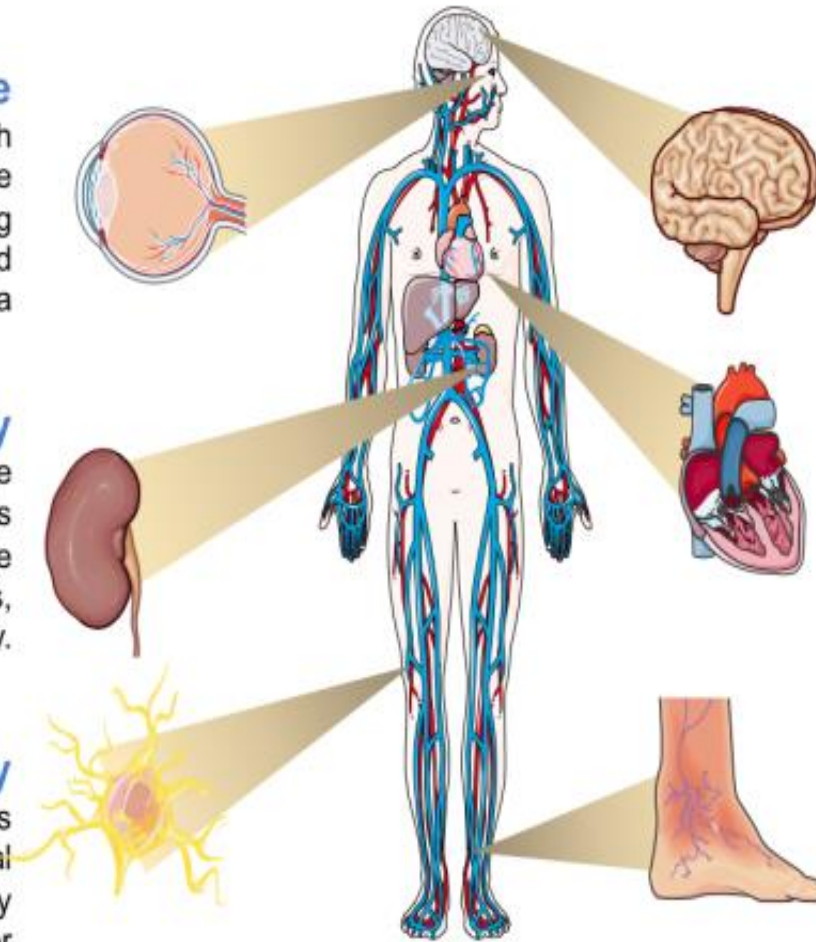
High blood glucose and high blood pressure can damage eye blood vessels, causing retinopathy, cataracts and glaucoma

Kidney

High blood pressure damages small blood vessels and excess blood glucose overworks the kidneys, resulting in nephropathy.

Neuropathy

Hyperglycemia damages nerves in the peripheral nervous system. This may result in pain and/or numbness. Feet wounds may go undetected, get infected and lead to gangrene.



Macrovascular

Brain

Increased risk of stroke and cerebrovascular disease, including transient ischemic attack, cognitive impairment, etc.

Heart

High blood pressure and insulin resistance increase risk of coronary heart disease

Extremities

Peripheral vascular disease results from narrowing of blood vessels increasing the risk for reduced or lack of blood flow in legs. Feet wounds are likely to heal slowly contributing to gangrene and other complications.

Thank you