Diabetes Mellitus

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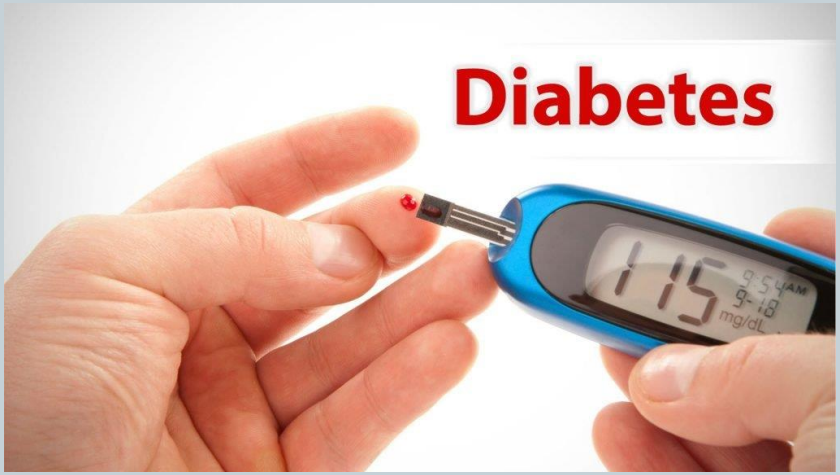

Definition

- DM is a heterogeneous group of diseases characterized by a state of chronic hyperglycemia, resulting from a diversity of aetiologies, environmental & genetic, acting jointly.
- The underlying cause of diabetes is the defective production or action of insulin.
- Insulin is a hormone that control glucose, fat and amino acid metabolism.

Classification

1. DM:

   - IDDM (Type 1)

   - NIDDM (Type 2)

   - Malnutrition-related DM

   - Other types (secondary to pancreatic/ hormonal/ drug induced/ genetic & other abnormalities)

2. Impaired Glucose Tolerance (IGT)
3. Gestational DM (GDM)

Type-1 DM

- Highest incidence among 10-14 year age group (<30 year)
- Most severe form, abrupt onset
- Immune mediated in 90% cases & idiopathic in 10% cases.
- Catabolic disorder in which circulating insulin is absent.
- So, exogenous insulin is required to reverse catabolic state .

Type-2 DM, IGT & Insulin resistance syndrome

- Type-2
  - Much more common
  - Gradual onset and occurs in middle aged and elderly
  - Complicated by presence of other diseases
- IGT
  - Intermediate state – at risk group (between diabetes mellitus and normality)
- Insulin resistance syndrome
  - Genetic defect exaggerated by obesity
  - Insulin resistance predispose to hyperglycemia which result in hyperinsulinemia which contribute to high level of triglycerides, sodium retention, thus inducing hypertension.

Problem statement

- Iceberg disease
- Worldwide:
  - 2001- 4% worldwide population- 143 million
  - 2025- 5% worldwide population- 300 million
  - 77% of total DM is in developing countries
- India:
  - Rural: 2.4%
  - Urban: 4 to 11.6%
  - In 1997, 1,02,000 persons died due to DM

Agent
Insulin deficiencies due to:

- Pancreatic disorders like inflammatory, neoplastic, cystic fibrosis
- Defects in formation of insulin e.g. synthesis of abnormal or biologically less active insulin molecule
- Destruction of β cells due to viral infection and chemical agents
- Decreased insulin activity due to decreased no.of adepocyte and monocyte insulin receptor
- Genetic defects e.g. mutation of insulin gene
- autoimmunity

Host factors

1. Age: rises with age
2. Sex: same in both (SEAR- Male)
3. Genetic factors- type 2- 90%, type 1- 50%
4. Genetic markers: IDDM associated with (type 1)
   HLA- B8, B15
   HLA- DR3, Dr4 (strong component)
   Type 2 is not HLA associated
5. Immune mechanism – Auto immunity for islet cells.
6. Obesity
7. Maternal Diabetes

Environmental risk factors

- Sedentary life style
- Diet
- Dietary fibres
- Malnutrition
- Viral infections
- Chemical agents eg. Rodenticides like VALCOR
- Stress
- Other factors like:
  - Occupation
  - Marital status
  - Religion
  - Economic status
  - Urbanization
  - Lifestyle changes
  - Education

Screening

- Urine examination- not considered as appropriate tool for case finding due to lack of sensitivity.
- Blood sugar testing
- Oral Glucose Tolerance Test - best
- Glycemic index

Diagnostic criteria for Diabetes

	Normal Glucose Tolerance, mg/dL (mMol/L)	Prediabetes	Diabetes Mellitus**
Fasting plasma glucose mg/dL (mmol/L)	<100 (5.6)	100–125 (5.6–6.9) (impaired fasting glucose)	⩾126 (7.0 mmol)
Two hours after glucose load* mg/dL (mmol/L)	<140 (7.8)	⩾140–199 (7.8–11.0) (impaired glucose tolerance)	(⩾200 (11.1)
HbA1c (%) (ADA criteria)	<5.7	5.7–6.4	⩾6.5

* Give 75 g of glucose dissolved in 300 mL of water after an overnight fast in persons who have been receiving at least 150–200 g of carbohydrate daily for 3 days before the test.

** A fasting plasma glucose ≥126 mg/dL (7.0 mmol) or HbA1c ≥ 6.5% is diagnostic of diabetes if confirmed by repeat testing.
Symptoms and random glucose level >200 mg/dL (11.1 mmol/L) are diagnostic, and there is no need to do additional testing.

High-risk group

- >40 years
- Family history
- Obese
- Women having baby born of 4.5 kg
- Women having excess weight gain during pregnancy
- Patients with premature atheresclerosis

Prevention

1. Primary:
    1. Population strategy
    2. High risk strategy
2. Secondary prevention
    1. Treatment of DM
    2. Testing regularly
    3. Self care
3. Tertiary prevention

    Prevention of complication through specialized clinics

THANK YOU