

ORAL GLUCOSE TOLERANCE TEST

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Objectives

- **Diagnosing Diabetes**
- **Illustrate the principle of the test**
- **Outline the indication of the test**
- **Interpret the results of the test**
- **Understand the precautions of the test.**

Diagnosing Diabetes

Fasting Plasma Glucose (FPG)

- Glucose level after not having food or drink for at least 8 hours

Result

- **Normal** - <100 mg/dl
- **Prediabetes** - 100 – 125 mg/dl
- **Diabetes** - >126 mg/dl

Random Plasma Glucose(RPS)

- Glucose level at any time of the day when severe diabetes symptoms are present.

Result

- **Diabetes** - > 200 mg/dl

HgbA1c

- test measures average blood glucose for the past 2 to 3 months.

Result

- **Normal** - less than 5.7%
- **Prediabetes** - 5.7% to 6.4%
- **Diabetes** - 6.5% or higher

- **Oral Glucose Tolerance Test (OGTT)**

- a two-hour test that checks the blood glucose levels before and 2 hours after consuming a high sugar drink

- **Result**

- **Normal** - less than 140 mg/dl

- **Prediabetes** - 140 mg/dl to 199 mg/dl

- **Diabetes** - >200 mg/dl

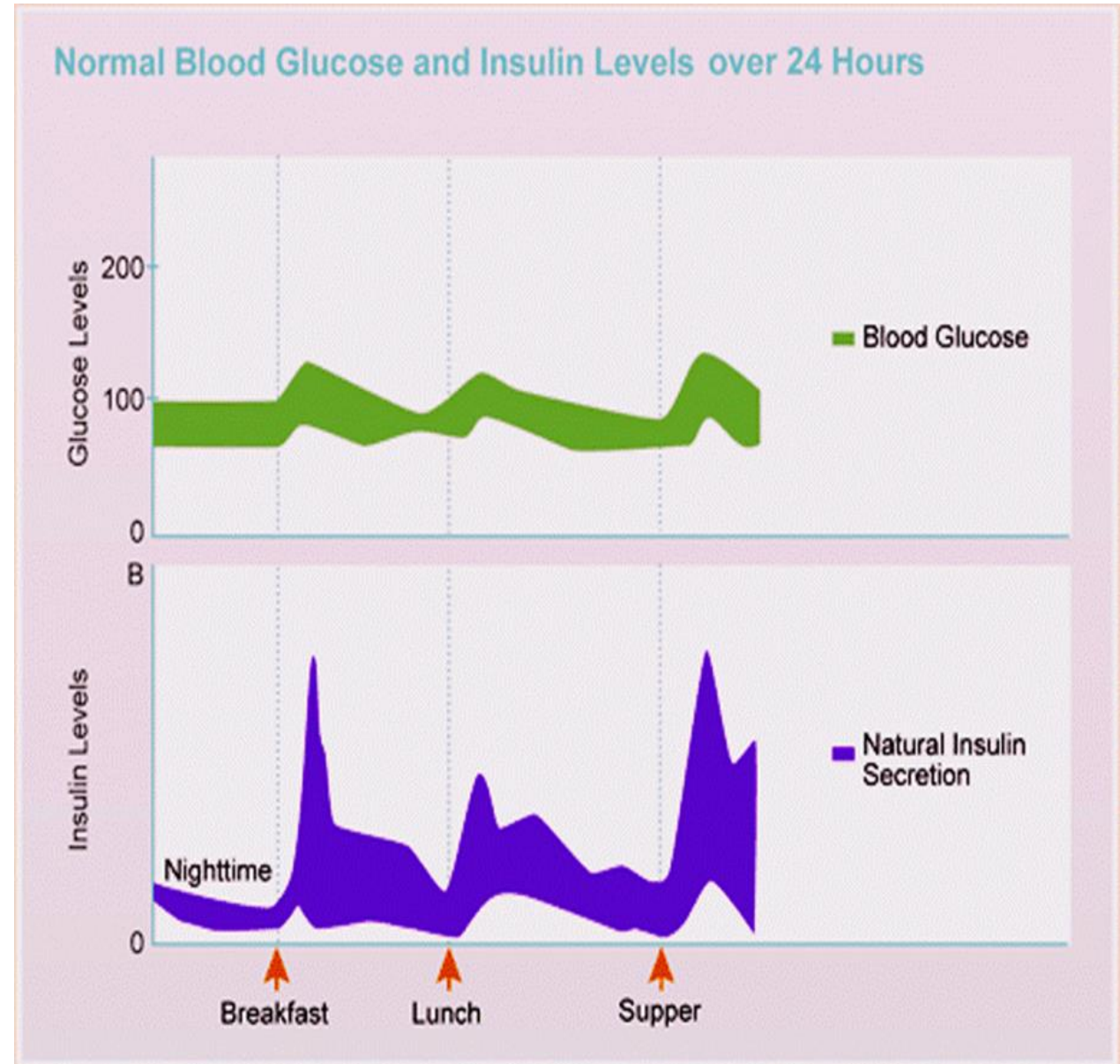
Regulation of blood glucose

The Fed State (Absorptive State);

The period from the start of absorption until absorption is completed.

The Fasting State;

Begins approximately 2 to 4 hours after a meal (when blood glucose levels return to basal levels) and continues until blood glucose levels begin to rise after the start of the next meal.



Oral glucose tolerance test (OGTT)

- Evaluate glucose tolerance in subjects with equivocal features of diabetes mellitus and do not have fasting blood glucose values in excess of 140 mg/dL.

Types of OGTT

Standard OGTT: A 2 hour 75gm oral glucose tolerance test is used to tests for diabetes. A fasting blood sample is collected before to test glucose level.

- **I/V glucose tolerance test:** Test is taken for malabsorption patients.
- **Mini glucose tolerance test:** As per current WHO recommendation only 2 samples are collected, fasting and 2 hours post glucose load.

Indication for test

- 1- family history of diabetes
- 2- obesity
- 3- Unexplained episodes of hyperglycemia
- 4- history of recurrent infections
- 5- in women, history of delivery of large infants, stillbirth, neonatal death, premature labor, and spontaneous abortions.
- 6- transitory glycosuria or hyperglycemia during pregnancy, surgery, trauma, stress, and MI.

Patients preparation

- 1- Normal diet & carbohydrate intake (150 g/dl) for 3 days.
- 2- Overnight fast (10-16 hours).
- 3- Resting for 30 min (seated) prior to test .
- 4- No smoking during test .
- 5- No drugs known to interfere with test , e.g. steroids

Protocol

- Glucose load : adult 75g of glucose dissolved in 250 ml of water, children 1.75 g/kg.
- Must be performed in morning and to remain seated during test .
- Glucose load given in flavored water and consumed within 5 min.
- Urine glucose estimations are not essential during test but useful if renal glycosuria a possibility.
- Blood samples : basal (pre-glucose) , 60min, 90min,120min.

1. Fasting for 8 - 12 hours



3

3. Glucose drink



2

2. Blood is withdrawn to test fasting blood glucose level



4

4. Blood samples are drawn for three times with the time interval of one hour



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Interpretation

Normal Blood Glucose :

Basal : < 5.6 mmol/L (100 mg/dl)

Intermediate sample : < 11.1 mmol/l (200 mg/dl)

2 hr sample : < 7.8 mmol/l (140 mg/dl)

HbA1c : 5-5.5 % (B.G=100-125mg/dl)

2-h Oral Glucose Tolerance Test (OGTT)

Objectives of the test; Diagnosis of Diabetes Mellitus and Intermediate Hyperglycemia

Table summarises the 2006 WHO recommendations for the diagnostic criteria for diabetes and intermediate hyperglycaemia

Diabetes

Fasting plasma glucose* $\geq 126\text{mg/dl}$
or
2-h plasma glucose** $\geq 200\text{mg/dl}$

Impaired Glucose Tolerance (IGT)

Fasting plasma glucose* $< 126\text{mg/dl}$
and
2-h plasma glucose** $\geq 140\text{mg/dl}$ and $< 200\text{mg/dl}$

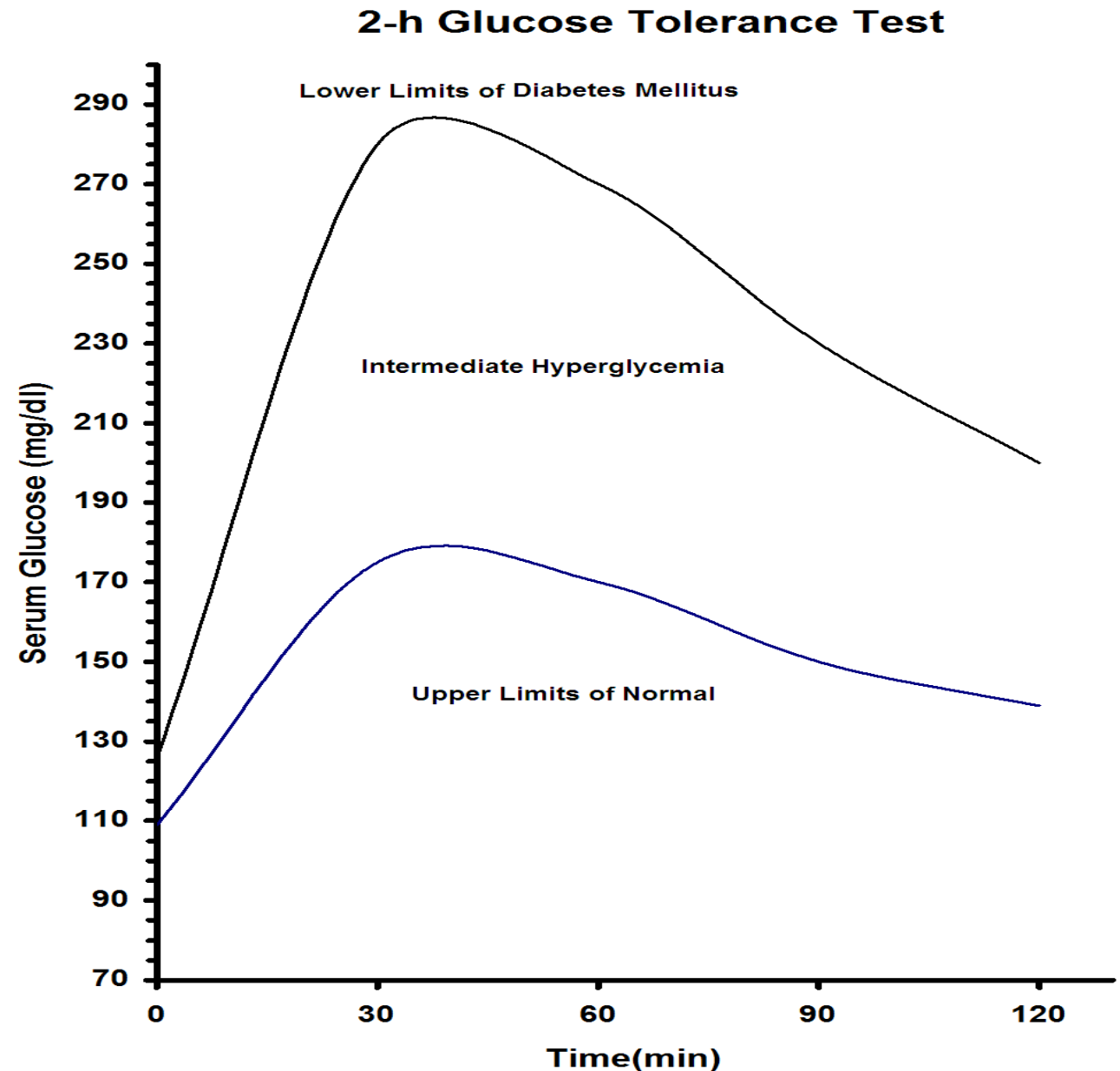
Impaired Fasting Glucose (IFG)

Fasting plasma glucose* 110mg/dl to 125mg/dl
and
2-h plasma glucose** $< 140\text{mg/dl}$

* after 12 h of fasting

** plasma glucose 2-h after ingestion of 75g oral glucose load

** If 2-h plasma glucose is not measured, status is uncertain as diabetes or IGT cannot be excluded



When OGTT is not indicated ?

- persistent fasting hyperglycemia > 140 mg/dl
- Persistent fasting normal glucose
- Patients with overt diabetes mellitus

Glucometer vs enzymatic estimation

Glucometer

- 1- fast
- 2- cheap
- 3- easily done by any person
- 4- not precise (no control)



Enzymatic estimation

- 1- fast (not like glucometer)
- 2- easily done in lab
- 3- precise & reliable (there is a control –standard)



THANK YOU

