GLUCOSE TOLERANCE TEST

(GTT)

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OBJECTIVES:

1. To determine the blood glucose concentrations following an oral glucose load.

2. To be able to discuss the physiological mechanisms by which blood glucose concentrations are controlled.

3. To recognize the importance of Glucose Tolerance Tests (GTTs) in diagnosis, particularly of diabetes mellitus.

WHAT IS A GLUCOSE TOLERANCE TEST?

- It is a laboratory method to check how the body breaks down (metabolizes) blood sugar, and how quickly it is cleared from the blood.

- It is one of the tools used to initial diagnosis of prediabetes, diabetes, insulin resistance.

2 types of GTT:

a. Oral Glucose Tolerance Test ***(OGTT)***

- ingestion of glucose solution in 5 minutes.
- most common form of GTT.
- fasting blood sugar (FBS) is measured before ingestion of glucose .

b. Intravenous Glucose Tolerance Test ***(IGTT)***

- glucose is injected into the vein for three(3) minutes.
- blood insulin levels are measured before the injection.

Indication -

Most commonly done to check diabetes in:

* Obese patients
* Pregnancy (as a screening test during the 24th – 28th weeks of pregnancy)
* Patients with non-healing skin infections or recurrent attacks of skin infections
* Patients with family history of diabetes

Contraindication

1. There is no indication for doing OGTT in a person with DM.

2. It has no role in follow up of diabetes. It is only for initial diagnosis.

PREPARATION AND PRECAUTIONS:

1. Patient instructed to take carbohydrate intake at least three (3) days prior to the test. balanced diet containing at least 150 – 200 gm
CHO/ day for three (3) days

2. Do not eat, drink, smoke or exercise strenuously for at least **8 hours before** the first blood sugar is taken.

3. All medications taken by the subject must be noted and stopped, if possible, at least three(3) days prior to the test.

PROCEDURE for OGTT:

1. The subject fasts for 10-14 hours or overnight.

2. Blood and urine samples are taken for analysis at zero time (baseline).

3. The subject is then given a glucose solution to drink. He / She ingests 1 g/kg BW in 300 ml. It should be drunk within 5 minutes.

4. Blood and urine samples are taken every 30 min (after taking glucose solution) for three hours.

Causes of Abnormal GTT

1. Impaired Glucose Tolerance

Here Blood glucose level are above the normal range but below the diabetic levels

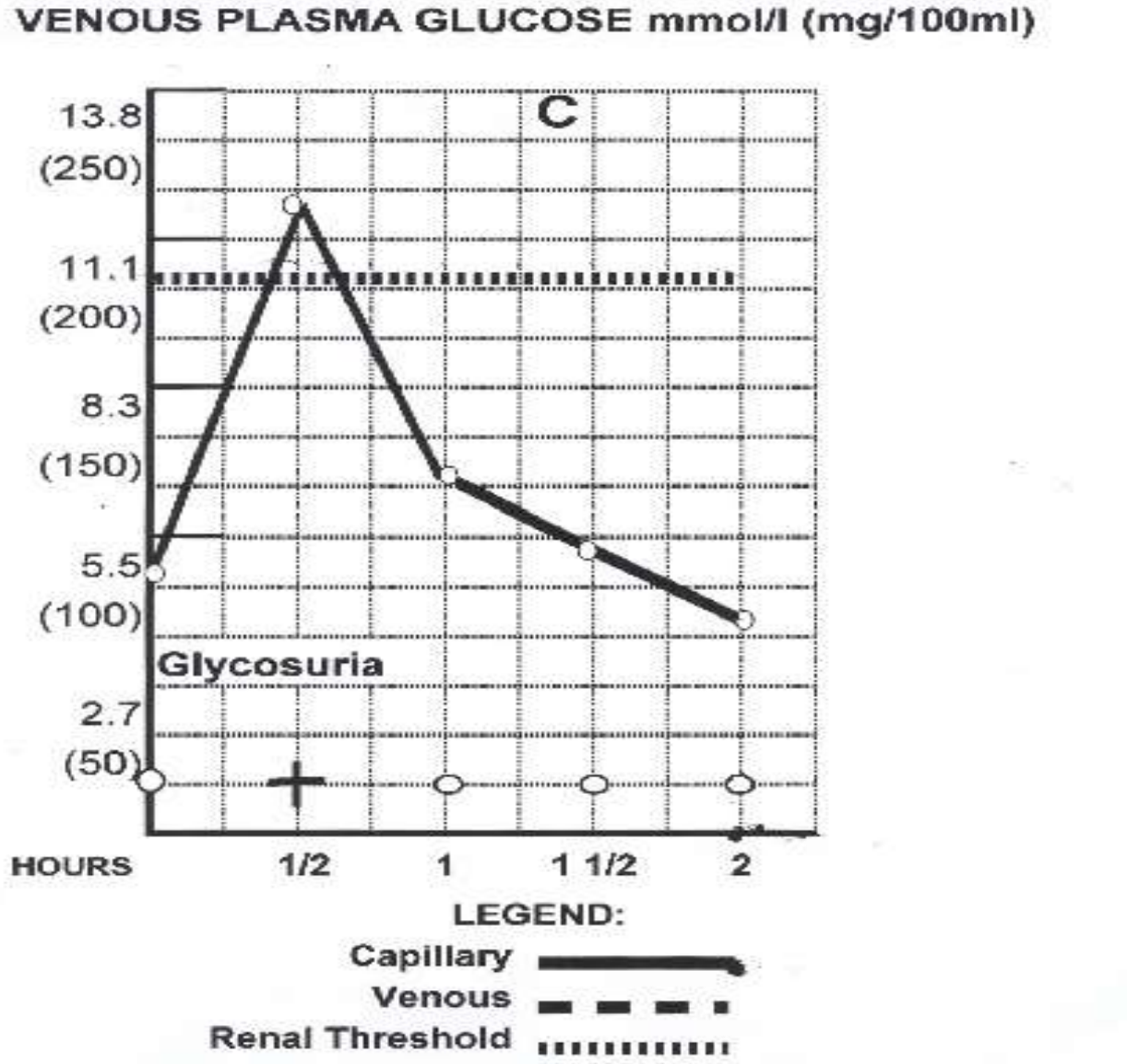
Such persons need careful follow up because it leads to frank diabetes

2.Impaired fasting Glycemia

- **In this condition fasting blood glucose level is above the normal range but 2 hr blood glucose(PP2BS) level is within normal range.**

1999 WHO Diabetes criteria – Interpretation of Oral Glucose Tolerance Test

Glucose levels	NORMAL		**Impaired Fasting Glycaemia**		**Impaired Glucose Tolerance**		**Diabetes Mellitus**	
			(I.F.G.)		**(I.G.T.)**		**(D.M.)**	
Venous Plasma	Fasting	2 hrs	Fasting	2 hrs	Fasting	2 hrs	Fasting	2 hrs
(mmol/l)	< 6.1	< 7.8	≥6.1 & <7.0	<7.8	< 7.0	≥ 7.8	≥ 7.0	≥11.1
(mg/dl)	< 110	< 140	≥110 & <126	<140	< 126	≥ 140	≥ 126	≥ 200


VENOUS PLASMA GLUCOSE mmol/l (mg/100ml)
13.8
(250)
11.1
(200)
8.3
(150)
5.5
(100)
2.7
(50)
C
Glycosuria
HOURS
1/2
1
1 1/2
2
LEGEND:
Capillary
Venous
Renal Threshold

MCQ

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1. GTT Is for

a) Diagnosis of Diabetes

b) Treatment of Diabetes

c) Follow up of Diabetes

d) All of above

2. Type 2 Diabetes mellitus is due to

a) Insulin deficiency

b) Cells resistance

c) Glucagon deficiency

d) All of above

3. Normal Blood glucose level in fasting is

a) 300-400 mg%

b) 70-110 mg%

c) 20-30 mg%

d) All of above

4. Impaired fasting glycaemia

a) Fating is in normal range

b) PP2BS is in normal range

c) Fasting is above normal range

d) None of above

5. Normal Blood glucose level in Post prandial blood glucose is

a) 300-400 mg%

b) 110-140 mg%

c) 20-30 mg%

d) All of above

- Book for Reference:
- D M Vasudevan
- Harpers
- U Satyanarayan

Video Link

https://www.youtube.com/watch?v=hbeWOIkbHJI/

Thank You!