



BCH 447

Oral Glucose Tolerance Test (OGTT)

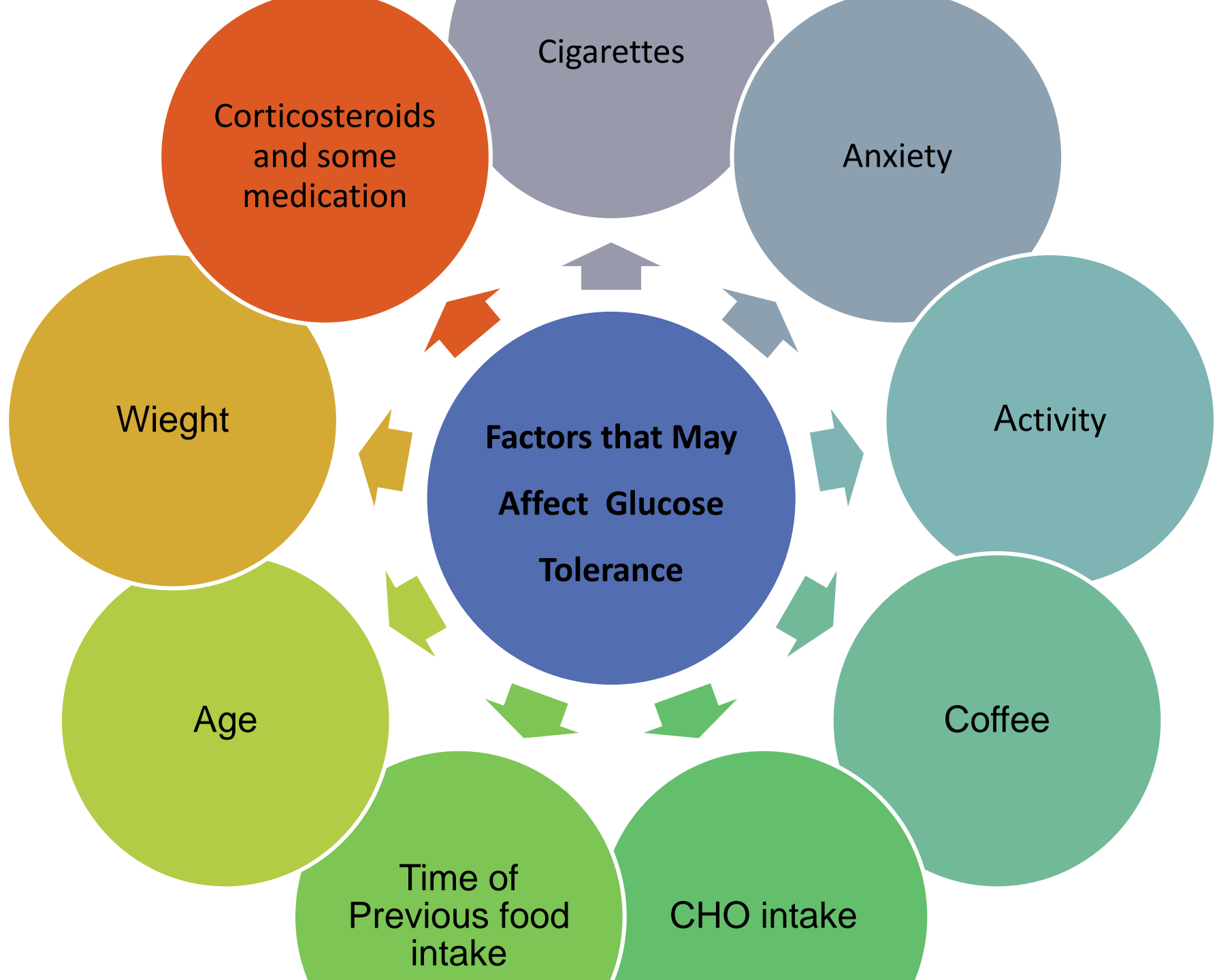


Objectives:

- Use OGTT in diagnosis of diabetes mellitus.

Introduction

- There are two types of glucose tolerance test (Oral and IV)
- The most common glucose tolerance test is **the oral glucose tolerance test (OGTT)**.
- The test reveals how quickly glucose is metabolized from the bloodstream for use by cells as energy source.
- Serial measurement of plasma glucose before and after glucose is given orally should provide a standard method to evaluate individuals and establish values for normal and disease states.



How does stress, caffeine and steroids affect OGTT ?

Stress:

When the body is under stress, the adrenal glands trigger the release of glucose stored in various organs, which often leads to elevated levels of glucose in the bloodstream.

Caffeine:

caffeine intake can acutely lower insulin sensitivity and increase glucose concentrations

Corticosteroid:

These drugs have also been called "glucocorticoids" because of their effects on glucose metabolism: Increases in blood glucose are common among people taking prednisone and other steroids.

How is the test performed?

- When an OGTT is ordered, the following conditions should be met:

- (1) Omit medications known to affect glucose tolerance.
- (2) Perform the test in the morning after 3 days of unrestricted diet and activity.
- (3) Perform the test after a 10-16 hours fast (**12 hour is best**).

- Oral dose : For adults, the recommended load is 75g and for children, 1.75 g/kg,

- Plasma glucose should be measured **fasting** then every 30 min for 2h **after** an oral glucose load

- **Note**: the time of collection is different, it is depend on the situation.

This test is recommended for :

- Generally most healthcare providers recommend that all pregnant women should be screened for ***gestational diabetes***.
- Experts recommend this test to pregnant women who are between 24 and 28 weeks of pregnancy .
- This test is also recommended for anyone suspected of developing adult diabetes.

OGTT side effect:

- Some people feel sweaty, light-headed, or may even feel short of breath or faint after drinking the glucose.
- However, serious side effects of this test are very uncommon.

Normal and abnormal results :

Normal :

Fasting: 60 -128 mg/dL **1 hour:** less than 200 mg/dL **2 hours:** less than 140mg/dL

-Higher-than-normal levels of glucose may mean you have **prediabetes** , **diabetes (type 2)**, or **gestational diabetes**.

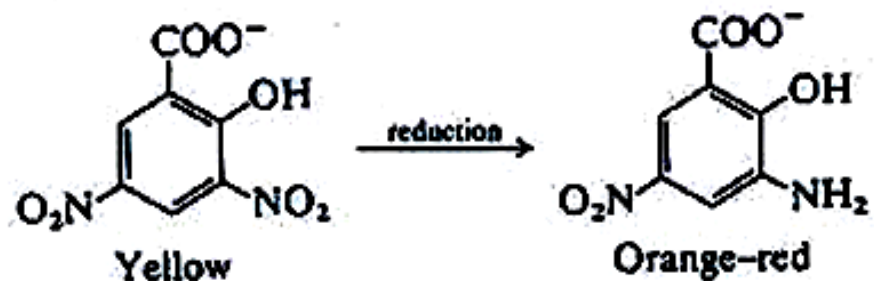
Or impaired glucose tolerance.

It means you are at increased risk for developing diabetes.



Principle:

- Several reagents can be used to assay reducing sugars such as 3, 5 dinitrosalicylic acid in one of the compounds.
- In alkaline solution it is reduced to 3-amino-5- nitro salicylic acid, which is orange-red.
- Absorbance is determined at 540 nm.



Method:

	Plasma	Standard	dH2O	DNS reagent
Test (a1) (Fasting plasma)	0.1	-	-	2 ml
Test (a2) (Fasting plasma)	0.1	-	-	2 ml
Test (b1) Tow- hour	0.1	-	-	2 ml
Test (b2) Tow- hour	0.1	-	-	2 ml
Standard (1)	-	0.1	-	2 ml
Standard (2)	-	0.1	-	2 ml
Blank	-	-	0.1	2 ml

↓
Mix the contents of each tube and cover each tube by Aluminum foil
↓
Boiling water bath for 5 minutes
↓
cool the tubes for 1-3 min
↓
Read absorbance at 540 nm

- RESULT:

Tubes	Absorbance at 540 nm
Test (a1)	
Test (a2)	
Test (b1)	
Test (b2)	
Standard (1)	
Standard (2)	

Calculations:

- Conc. Of Std. = 0.1 g/dl.
- Sample A = Fasting plasma glucose
- Sample B = Two hour plasma glucose
- Amount of glucose in plasma = $\frac{\text{Mean Abs Test}}{\text{Mean Abs Std.}} \times \text{conc. of Std} = \text{Z g/dl}$
- Z g/dl X 1000 = Y mg/dl

Calculate the glucose in fasting and two hrs plasma glucose ..

Then discuss your results ..