
OGTT - Test

ORAL GLUCOSE TOLERANCE TEST (OGTT)

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Obectives of the session

- **Sharing brief ideas about OGTT**

National Guideline on Diabetes Mellitus

First Edition

Non Communicable Disease Control Programme
Directorate General of Health Services
Ministry of Health & Family Welfare

Introduction of OGTT

- OGTT means Oral Glucose Tolerance Test.
- First introduced by Jerome W. Conn, an American endocrinologist in 1940.
- The Gold Standard Test for diagnosing glucose intolerance according to National Guideline on DM.

Introduction of OGTT

Glucose Tolerance :

- **is the body's dynamic ability to maintain normoglycemia after a glucose load.**

Introduction of OGTT

- **Normal Blood Glucose Level :**

➢ **FBG: 3.5-5.5 mmol/L**

➢ **Normal RBG: <7.8mmol/L**

Lab Diagnosis of DM

Done through following tests :

- **Oral Glucose Tolerance Test (OGTT) - Gold standard test.**
- **Fasting Plasma Glucose (FPG)**
- **Random Plasma Glucose (RPG)**

Blood glucose Assay is done by Glucose Oxidase Method using plasma.

Biochemical Basis of OGTT

Glucose uptake depends on insulin secretion & tissue sensitivity.

OGTT evaluates the dynamic response of glucose-insulin metabolism.

High post-load glucose in OGTT indicates insulin resistance or beta-cell dysfunction.

Purpose of OGTT

- **Assessment of endogenous insulin response to physiological glucose challenge**

Indication of OGTT

Used for dx of DM, where fasting or result is inconclusive e.g. random BG:

- **If FBG : 5.6-6.9 mmol/L (IFG)**
- **If RBG : 7.8-11.0 mmol/L (IGT)**
- **HbA1C : 5.7-6.4%**

Indication of OGTT

Used for dx of DM, where fasting or result is inconclusive e.g. random BG:

- Diagnosis of GDM
- Obesity, D.M, dyslipidemia & other risk factors

Pre-diabetes

IGT and IFG are referred to as Prediabetes.

high risk of development of Diabetes.

it's most obvious in T2DM.

Carries

cardio-metabolic risk dyslipidemia, hypertension, cardiovascular disease.

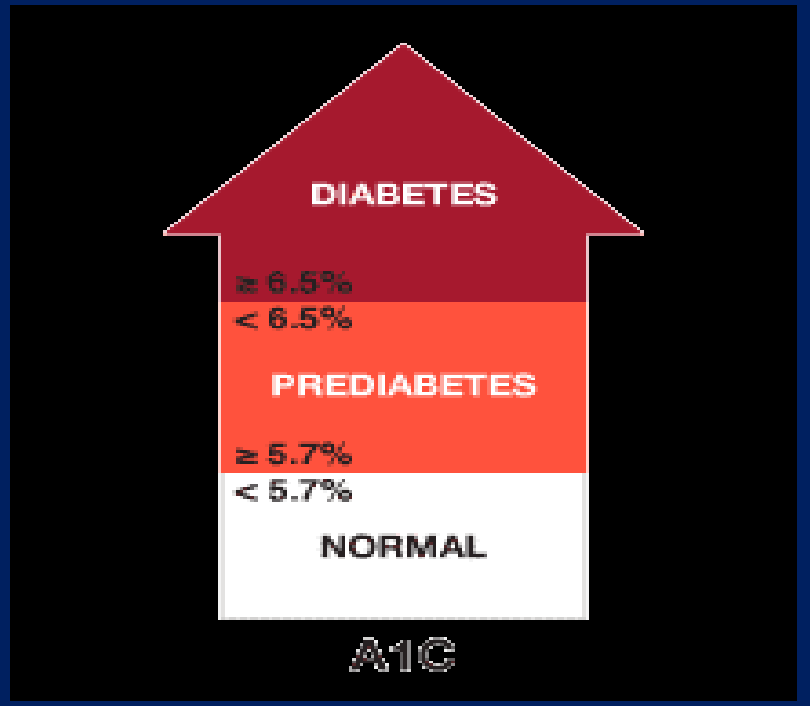
Increased Risk For Developing Diabetes (Prediabetes)

FPG— 5.6 to 6.9 mmol/L (Impaired Fasting Glucose-IFG)

2-h PG in the 75g OGTT —7.8 to 11.0 mmol/L (Impaired Glucose Tolerance-IGT)

HbA1c 5.7–6.4%

(According to ADA & National guideline)



Glucose Tolerance Test (OGTT)

1

No Food or Drink
8 to 12 Hours
Prior to Test

2

Drink Glucose
(Sugar) Solution

3

Blood Samples
Taken and Tested

Preparation for OGTT

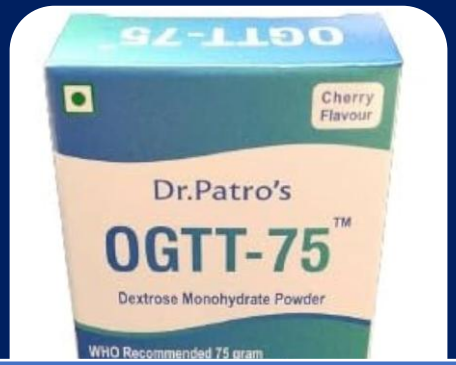
- Unrestricted carbohydrate diet in 3 days before test.
- Over night (8-12hrs) fasting.
- Avoid stress, smoking and exercise.
- Treatment of any infection (If present).
- Advised rest during and prior to the test.

Medications that should be avoided

- ✓**Thiazide diuretics.**
- ✓**Corticosteroid.**
- ✓**Synthetic forms of estrogen.**
- ✓**Phenytoin (commonly known as Dilantin) .**

Procedure of OGTT

Step 1 : Fasting blood glucose sample collection



Step 2 : Administer 75 g anhydrous glucose in 300 ml of water within 5 minute

Step 3 : 2nd blood sample is taken 2hrs after glucose intake

Interpretation according to WHO

Diabetes	**Fasting blood glucose ≥7.0mmol/l (126mg/dl) and**	**2–h after ingestion of 75g oral glucose load ≥11.1mmol/l (200mg/dl)**
Impaired Glucose Tolerance (IGT)	**<7.0 mmol/l (126mg/dl) and**	**≥7.8 but <11.1mmol/l (140mg/dl and 200mg/dl)**
Impaired Fasting Glucose (IFG)	**5.6 to 6.9mmol/l (100mg/dl to 125mg/dl)**	**<7.8mmol/l (140mg/dl)**

Interpretation according to ADA

Normal	IFG	IGT	Diabetes
<6.1 (*5.6)	≥6.1 (*5.6)-6.9	<7.0	≥7.0
and	and	and	or / and
<7.8	<7.8	≥7.8 -<11.1	≥11.10

(Plasma glucose in mmol/L *ADA criteria; different from WHO)

WHO 2013 Criteria for Diagnosis of GDM (based on IADPSG recommendations):

- **A diagnosis of GDM is made if any one of the following plasma glucose values is met or exceeded:**

Time Point	Plasma Glucose Threshold (mmol/L)	Plasma Glucose Threshold (mg/dL
Fasting	≥ 5.1 mmol/L	≥ 92 mg/dL
1 hour	≥ 10.0 mmol/L	≥ 180 mg/dL
2 hours	≥ 8.5 mmol/L	≥ 153 mg/dL

Factors adversely affecting OGTT

- **Insulin deficiency**
- **Carbohydrate starvation**
- **Exercise**
- **Liver disease**
- **Acute infection**
- **Thyroid disorder (Both hypo & Hyperthyroidism)**

Importance of OGTT

- ✓ **Gold standard to diagnose Diabetes Mellitus**
- ✓ **Pre-diabetes**
- ✓ **GDM**
- ✓ **Acromegaly**

Advantages of OGTT

High sensitivity

Detects early metabolic dysfunction

Essential for managing high-risk pregnancies

4 Proven Lifestyle Changes for Treating Diabetes

1. Dietary Modifications

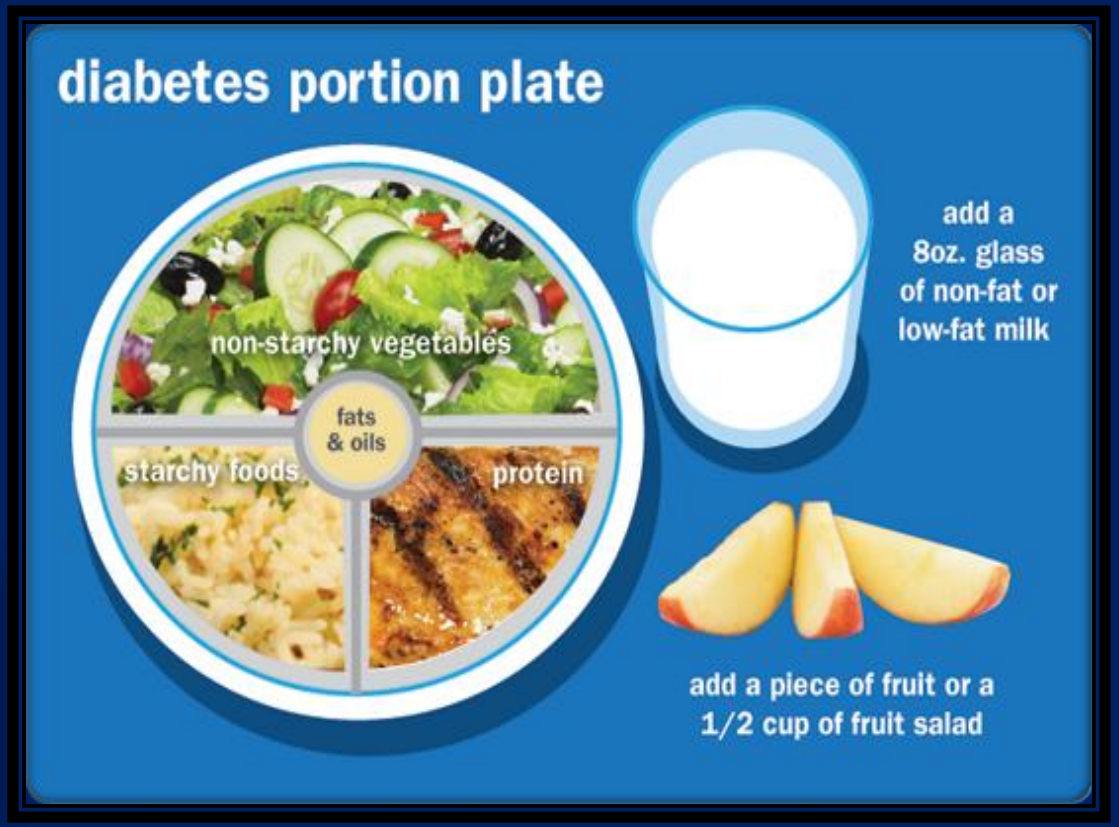
2. Regular Physical Activity

3. Weight Management

4. Stress Management

Lifestyle Modifications in Diabetic & Pre-Diabetic Patients

- Diet Control
- Balanced diet
- High fiber foods
- Portion control



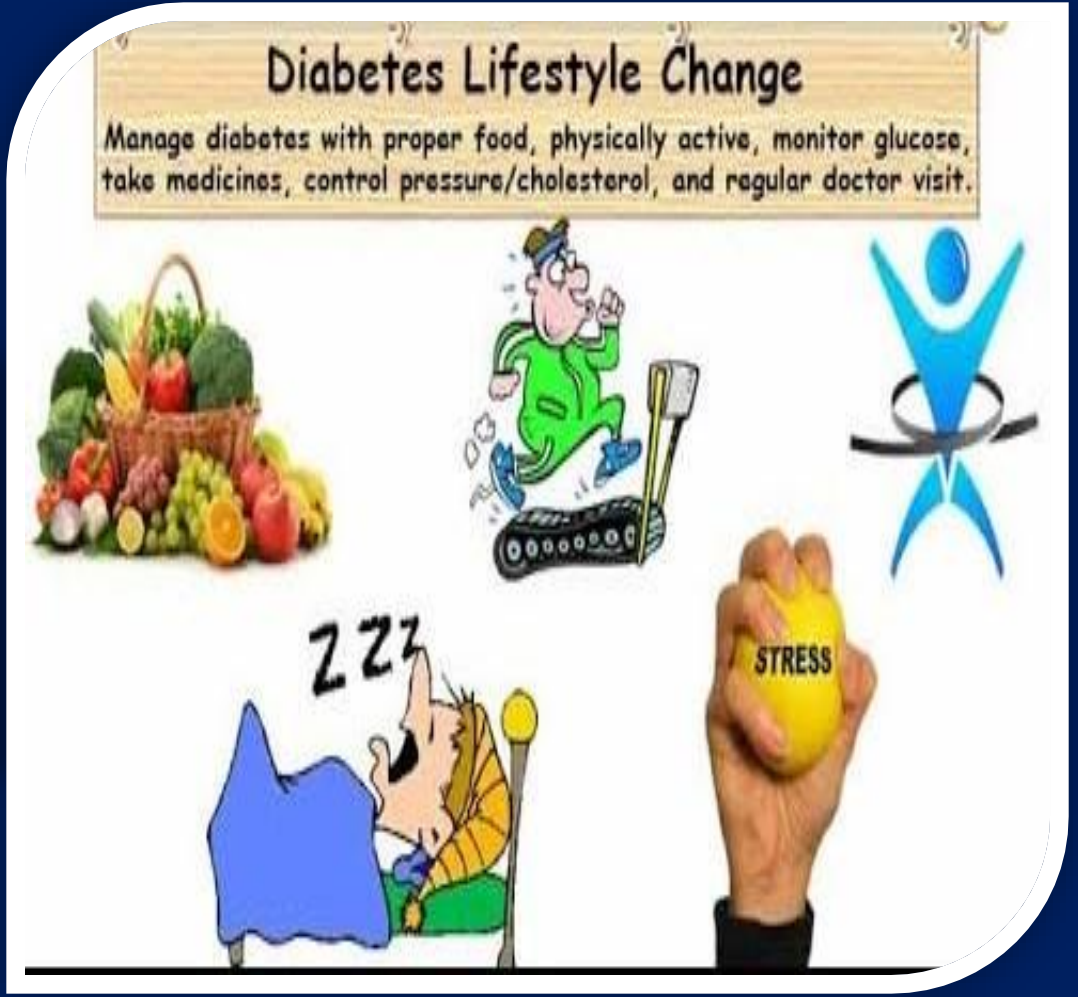
Lifestyle Modifications in Diabetic & Pre-Diabetic Patients

Good Sleep Hygiene: Aim for 7–8 hours of quality sleep per night

Routine Medical Checkups, Monitor HbA1c, fasting glucose, OGTT regularly. Adjust lifestyle and medications as needed

Prevent complication

Improve the quality life




Diabetes Self Management Education and Support
Dietary Knowledge and Behaviors
Personalized Physical Activity Prescription
Medication Adherence
Glucose Monitoring
Technology Use
Coping and Management Strategies
Risk Reduction Efforts

Raising Awareness

- Diabetes is a silent killer – many remain undiagnosed
- Early detection prevents complications
- In Bangladesh, 73% of diabetic patients are unaware of their condition (WHO, 2023)
- Lack of public education & No routine screening in rural and underserved areas

Raising Awareness

- Key Awareness Strategies

References & Link

- National Guideline on Diabetes Mellitus First Edition
- abc of medical biochemistry (10th edition)
- Practical Biochemistry (dr. Bimol kumar Agarwala)
- **Online resources**.


THANK YOU!