Oral Glucose Tolerance Test

The oral glucose tolerance test (also known as a GTT or OGTT) is used to investigate if you have diabetes by assessing how your body responds to a dose of glucose (sugar) given as a drink. The glucose tolerance signifies the ability of the body to tolerate excess load of glucose and to dispose of an additional load of glucose given, Oral GTT is most commonly used in the laboratories because it is easy to give glucose load orally.

Why do I need to have this test?

Your doctor will refer you for a glucose tolerance test if your symptoms, previous blood tests, family history or other related factors could indicate you have diabetes. If you are pregnant, you may be asked to have a GTT to investigate diabetes of pregnancy.

What is the benefit of the test?

1. It is mainly used in the detection of diabetes mellitus, or a related condition which means you are at risk of developing diabetes in the future.
2. This test is useful in distinguishing a person with a normal glucose tolerance from a person who has increased or decreased tolerance.
3. It is of great value in detecting renal glucosuria and endocrine malfunction. When the blood glucose level exceeds about 160-180mg/dl, excrete glucose in the urine.

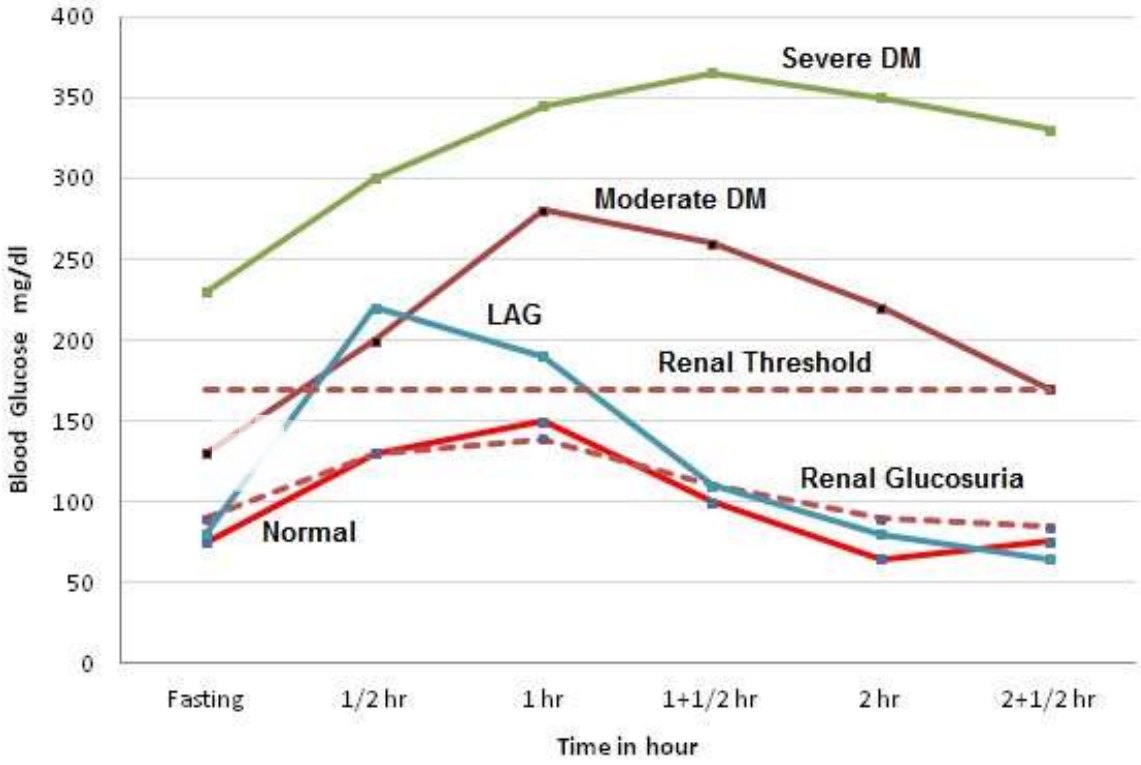
Patient Preparation

1. The patient should be on balanced diet, containing normal daily requirement of carbohydrates, at least 2-3 days prior to the test.
2. Ensure you have had nothing to eat or drink (other than plain water) overnight for 8-12 hours prior to coming in for your test. DO NOT fast for longer than 15 hours, as this may affect your results.
3. Water is allowed anytime overnight. Please maintain adequate level of plain water consumption to ensure good hydration.
4. Smoking, food or drinks are not permitted during the test.
5. Patients should be in a position to wait at the laboratory for at least 2-3 hours, since 5 or more blood samples are collected at the interval of 30 minutes.

Procedure for OGTT

1. After an overnight fasting of 12 hrs. The subject is ready for the test.
2. A fasting sample of venous blood is collected.
3. You will be given a glucose drink. Must be finishing the drink in a maximum of 5 minutes.
4. The individual is given usually 1 gm glucose/kg weight or 75 grams of glucose dissolved in water (about 250 ml), and the time is noted.
5. A total of five samples of venous blood and urine are collected every 1/2 hour (30 minutes) after the oral glucose .
6. Glucose content of all five samples of blood are estimated by the specific methods used in laboratory. Corresponding urine samples are tested qualitatively for the presence of glucose.
7. A curve is plotted by plotting time on X-axis and plasma glucose level on Y-axis, which is called Glucose Tolerance Curve (GTC)

Normal values and interpretation of OGTT



Normal response

- Initial fasting glucose within normal limits.
- The highest peak value is reached within 1 hour.
- The highest value does not exceed the renal threshold (160-180 mg/dl).
- The fasting level is again reached by 2-2.5 hours.
- No glucose or ketone bodies are detected in any specimen of urine.

Response of diabetic patients

- Fasting blood glucose is definitely raised above 110 mg/dl.
- The highest value is reached after 1-1.5 hours. ○ The highest value exceeds the renal threshold. ○ The blood glucose level does not return to fasting level within 2.5 hours. This is the most characteristic feature of DM.
- Urine sample always contains glucose

LAG Curve for hyperglycemia

- Fasting glucose level is normal.
- Rises rapidly in the 1/2 to 1 hour and exceeds the renal threshold so that the corresponding urine specimens show glucose.
- The return to normal value is rapid and complete.

This curve is obtained in:

1. Hyperthyroidism
2. During Pregnancy
3. Also in early diabetes

Curve for Renal Glucosuria □ Glucose appears in the urine at levels of blood glucose much below renal threshold.

It may be seen in:

4. Renal disease and pregnancy
5. Early diabetes