



AL-MUSTAQBAL UNIVERSITY COLLEGE

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Clinical Biochemistry

(Other Test for Estimation of Blood Glucose)



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((The glucose Tolerance Test))

(GTT) is the most sensitive test for detecting borderline diabetes mellitus. Glucose tolerance means ability of the body to utilize glucose in the circulation. It is indicated by the nature of blood glucose curve following the administration of glucose. Thus “glucose tolerance test” is a valuable diagnostic aid in the diagnosis of diabetes mellitus, insulin resistance, impaired beta-cell function and sometimes reactive hypoglycemia and acromegaly.

GTT is of two types depending upon the route of glucose administration: Oral Glucose Tolerance Test (OGTT) Intravenous Glucose Tolerance Test (IVGTT). OGTT is mostly preferred and is explained in detail here. IVGTT may be chosen for patients who are unable to absorb an oral dose of glucose (eg. malabsorption syndrome).

HbA_{1c}?

-HbA_{1c} is your average blood glucose (sugar) levels for the last two to three months. If you have diabetes, an ideal HbA_{1c} level is 48mmol/mol (6.5%) or below.

-If you're at risk of developing type 2 diabetes, your target HbA_{1c} level should be below 42mmol/mol (6%).

-HbA_{1c} is what's known as glycated haemoglobin. This is something that's made when the glucose (sugar) in your body sticks to your red blood cells. Your body can't use the sugar properly, so more of it sticks to your blood cells and builds up in your blood. Red blood cells are active for around 2-3 months, which is why the reading is taken quarterly.

What is a HbA1c test?

-The hemoglobin A1c (HbA1c) test measures the amount of blood sugar (glucose) attached to your hemoglobin. Hemoglobin is the part of your red blood cells that carries oxygen from your lungs to the rest of your body. It is an important blood test that gives a good indication of how well your diabetes is being controlled.

-You can check these average blood sugar levels yourself, but you'll have to buy a kit, whereas your healthcare professional will do it for free. It's different from a finger-prick test, which is a snapshot of your blood sugar levels at a particular time, on a particular day.

-You find out your HbA1c level by getting a blood test by a doctor or nurse. Your healthcare team will arrange this for you, but chase it up with your GP if you haven't had one for a few months.

-Most people will have the test every three to six months. But you may need it more often if you're planning for a baby, your treatment has recently changed, or you're having problems managing your blood sugar levels.

-And some people will need the test less often, usually later on during pregnancy. Or need a different test altogether, like with some types of anaemia. A fructosamine test can be used instead, but it's very rare.

An HbA1c test is also used to diagnose diabetes, and to keep an eye on your levels if you're at risk of developing diabetes (you have prediabetes).

The test is sometimes called haemoglobin A1c or just A1c.

Hemoglobin A1C(HbA1c)

-Glycosylated hemoglobin is the term used to describe the formation of a hemoglobin compound produced when glucose (a reducing sugar) reacts with the amino group of hemoglobin (a protein). The glucose molecule attaches nonenzymatically to the hemoglobin molecule to form a ketoamine. The rate of formation is directly proportional to the plasma glucose concentrations. Because the average red blood cell lives approximately 120 days.

-The glycosylated hemoglobin level at any one time reflects the average blood glucose level over the previous 2 to 3 months. Therefore, measuring the glycosylated hemoglobin provides the clinician with a time-averaged picture of the patient's blood glucose concentration over the past 3 months.

-HbA1c, the most commonly detected glycosylated hemoglobin, is a glucose molecule attached to one or both N-terminal valines of the β -polypeptide chains of normal adult hemoglobin. HbA1c is a more reliable method of monitoring long-term diabetes control than random plasma glucose. Normal values range from 4.0% to 6.0%.