

Diagnosis of Diabetes Mellitus

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About the Study

Diabetes can be diagnosed based on individual response to oral glucose load, the Oral Glucose Tolerance Test (OGTT). The subject should have been taking carbohydrate-rich diet for at least 3 days before the test. All the drugs which are known to overtake carbohydrate metabolism should be discontinued for a minimum of 2 days. The subjected person should avoid intense workout on the previous day of the test. He/she should be in an overnight fasting state (at least 10 hours) otherwise called as intermittent fasting. During the course of Glucose Tolerance Test (GTT) the person should be comfortably seated and should abstain from smoking and exercise.

Glucose tolerance test should be conducted preferably in the morning (ideal time 9 AM to 11 AM). A fasting blood sample is taken and urine is collected. The subjected person is administered with 75 g glucose orally which is dissolved in about 300 ml of water, to be drunk in about 5 minutes. Blood and urine samples are collected at 30 minutes intervals for at least 2 hours. All blood samples are subjected to glucose estimation while urine samples are qualitatively tested for glucose. The fasting plasma glucose level in 75-110 mg/dl in normal persons. On oral glucose load, the concentration increases and the peak value (140 mg/dl) is reached in less than an hour which returns to normal by 2 hours. Glucose is not detected in any of the urine samples. In individuals with impaired glucose concentrations, the fasting as well as 2 hour plasma glucose levels are elevated. These subjected persons slowly develops frank diabetes at an estimated rate of 2% per year. Dietary restriction and exercise are advocated for the

treatment of impaired glucose tolerance. A person is said to be suffering from diabetes mellitus if his/her fasting plasma glucose exceeds 7.0 mmol/l (126 mg/dl) and, at 2 hours 11.1 mmol/l (200 mg/dl).

For conducting glucose tolerance test in children, oral glucose is given on the basis of body mass (1.5 to 1.75 g/kg). In case of pregnant women, 100 g oral glucose is advisable. Further, the diagnostic procedure for diabetes in pregnancy should be more stringent than WHO recommendations. The GTT is rather unphysiological. To evaluate the glucose concentration of the body under physiological conditions, fasting blood sample is taken, the subjected person is allowed to take heavy breakfast, blood samples are collected at an interval of 1 hour and 2 hours (postprandial). Urine samples are also collected. This type of test is commonly employed in diabetic patients for monitoring the control. For individuals with malabsorption, intravenous glucose tolerance test is carried out. Corticosteroid stressed glucose tolerance test is employed to detect latent diabetes.

The commonest cause of glucose excretion in urine (glycosuria) is diabetes mellitus. Therefore, glycosuria is the first line screening test for diabetes. Normally, glucose does not appear in urine until the plasma glucose concentration exceeds renal threshold (180 mg/dl). As age advances, renal threshold for glucose increases marginally. In certain individuals, blood glucose level rises rapidly after meals resulting in its spill over urine. This condition is referred to as alimentary glycosuria. It is observed in some normal people and in patients of hepatic diseases hyperthyroidism and peptic ulcer.