Oral Glucose Tolerance Test

Principle

The Glucose Tolerance test is used for the diagnosis of Diabetes Mellitus and related disease conditions. The oral glucose tolerance test requires a fasting glucose blood draw followed by a 75 gram dose of glucola, then a 2 hour post load glucose blood draw. An abnormally high fasting glucose value with a delayed return to normal indicates decreased tolerance to glucose and supports a diagnosis of either impaired tolerance or a provisional diagnosis of diabetes.

Patient Preparation

The following conditions should be met before performing an oral glucose tolerance test.

1. Discontinue, when possible, all non-essential medications known to affect glucose metabolism. Medications include: apmetamine, arginine, beta-adrenergic blockers, diuretics, epinephrine, glucocorticoids, glucose administered intravenously, insulin, lithium, oral contraceptives, oral hypoglycemic agents, phenothiazines, phenytoin, and salicylates.

2. Patient must be fasting for at least 8 hours, but no more than 14 hours before the test (water is acceptable).

3. Individual should remain at rest, and avoid medications, smoking, caffeine, and alcohol before and during the test. Alcohol should not be consumed a minimum of 3 days prior to the test.

4. The individual should not be ill and should have had normal physical activity and carbohydrate intake greater than 150 grams/day for at least 3 days before the test.

5. Should not be done during recovery from acute illness, emotional stress, surgery, trauma, pregnancy, inactivity due to chronic illness; therefore, is of limited value in hospitalized patients. A two week recovery time is recommended before tolerance testing.
Reagents

Glucose Tolerance Beverage, 75 grams

Procedure

1. Patient must be fasting for at least 8 hours, but no more than 14 hours before the test. Water is acceptable during the fast.

2. Collect a fasting blood glucose specimen from the patient.

3. Give adult patients 75 grams of glucose (1 full bottle of glucose tolerance beverage). The glucose beverage should be consumed within 5 minutes. The patient should remain at rest and avoid medications, smoking, caffeine and alcohol for the duration of the test. Water is allowed.

For children, the dose of glucola must be adjusted for the weight of the child. Children: 1.75g/kg up to 75g of Glucola.

(Weight in lbs/2.2)1.75 = grams of Glucola to be given not to exceed 75 grams.

4. Obtain blood glucose specimen 2 hours after the patient finishes drinking the glucose tolerance beverage.

Continue sample collection at 3, 4, 5 or 6 hours if other than the standard 2-hour tolerance is requested.

** This procedure is not to be used for gestational patients.

Reference Ranges

All tolerance tests are reported along with the following comment:

Reference ranges based on the American Diabetes Association Clinical practice recommendations:

Glucose load: 75 gram glucose drink

Fasting glucose: Normal: <100 mg/dL
Impaired fasting glucose: 100-125 mg/dL
Diabetes: ≥126 mg/dL

2 hour post load of glucose: Normal: <140 mg/dL
Impaired glucose tolerance: 140 – 199 mg/dL
Provisional diagnosis of diabetes: ≥ 200 mg/dL **

** Must be confirmed on more than one testing occasion.

**Adverse Reactions**

The heavy glucose load can result in nausea and vomiting in some patients. The test is invalid and must be terminated if the patient vomits within the first two hours of testing.

Occasionally a patient will respond to the glucose tolerance test with a dangerously low blood glucose level. These patients become weak, lightheaded, and may faint. Efforts are made to complete the test in these situations, but the phlebotomist must seek help from the Lab or Outpatient nurses if the patient experiences a severe reactions.

**References**


World Health Organization; *Laboratory diagnosis and monitoring of diabetes mellitus*, 2002 p. 16.
