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Growth Hormone Suppression Test

GH secretion is part of the counter-regulatory defence against hypoglycaemia and physiological GH secretion is inhibited by hyperglycaemia. In acromegaly, or gigantism, GH secretion is autonomous and does not suppress and may paradoxically rise with hyperglycaemia.

Indications

This is the gold standard investigation to establish the biochemical diagnosis of acromegaly or gigantism. This test is also used to assess response to medical/surgical treatment of acromegaly.

Side Effects

Some subjects feel nauseated and may have vaso-vagal symptoms during this test.

Requirements

- Adults POLYCAL® 113mL or 75g anhydrous glucose (made up to 200mL with water) plus 100mL cold water, total 300mL
- 6 x yellow top fluoride EDTA tubes, 7 x brown top serum tubes
- Indwelling cannula.

Procedure

PATIENT PREPARATION

The patient should fast from midnight (sips of water allowed) and should rest throughout the test.

Minutes	Procedure	Sample
0	Insert cannula and take samples for growth hormone, glucose and IGF-1 Drink glucose solution/polycal within 5 minutes	1 x yellow top fluoride EDTA (glucose) 1 x brown top serum (GH) 1 x brown top serum (IGF-1)
30	Take samples for Growth Hormone and Glucose	1 x yellow top fluoride EDTA (glucose) 1 x brown top serum (GH)
60	Take samples for Growth Hormone and Glucose	1 x yellow top fluoride EDTA (glucose) 1 x brown top serum (GH)
90	Take samples for Growth Hormone and Glucose	1 x yellow top fluoride EDTA (glucose) 1 x brown top serum (GH)
120	Take samples for Growth Hormone and Glucose	1 x yellow top fluoride EDTA (glucose) 1 x brown top serum (GH)
150	Take samples for Growth Hormone and Glucose	1 x yellow top fluoride EDTA (glucose) 1 x brown top serum (GH)

Ensure the patient is given food and drinks before discharge.

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Interpretation of results

Normal subjects will exhibit suppression of GH to $<0.3 \mu\text{g/L}^2$

Failure of suppression or a paradoxical rise in GH suggests acromegaly.

NB paradoxical rise in GH may occur during GTT during normal adolescence.

Sensitivity and specificity

GH may fail to suppress due to chronic renal failure, liver failure, active hepatitis, anorexia nervosa or other causes of chronic starvation, malnutrition, hyperthyroidism, diabetes mellitus and in adolescence.

Reference²: Automated 22-kD Growth Hormone-specific assay without interference from Pegvisomant.
Manolopoulou J et al. Clin Chem 58:10; 1446-1456 (2012)

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