TEST

Anti-insulin antibody test

A blood test that looks for immune proteins that bind to insulin

WHAT IT MEASURES
Antibodies that bind insulin in the blood

SAMPLE
Blood

FASTING NEEDED?
No, unless part of a supervised hypoglycemia evaluation

HOW LONG IT TAKES
Less than 10 minutes for the blood draw

RESULTS IN
Several days, with timing varying by laboratory

USED FOR
Diagnosis alongside other diabetes or hypoglycemia tests

MAIN LIMITATION
Cannot reliably separate spontaneous antibodies from insulin-treatment antibodies

Overview

An anti-insulin antibody test measures antibodies that bind to insulin. Antibodies are immune-system proteins. Insulin is a hormone that helps glucose move from the blood into cells for energy.

Insulin autoantibodies can develop when the immune system reacts against the body's own insulin. They may be a sign of type 1 diabetes, particularly in younger children. Antibodies can also develop after treatment with injected or pumped insulin. Standard tests usually cannot distinguish treatment-related antibodies from those present before treatment.

In some people, antibodies bind and later release insulin. This can interfere with insulin measurements and, rarely, contribute to low or high blood glucose. Results must be interpreted with symptoms, insulin-treatment history and other laboratory tests.

Why the test is ordered

The test may be included in a panel used to assess possible type 1 diabetes. Other tests may

look for antibodies to GAD65, IA-2 or ZnT8. If possible, the sample is collected before insulin treatment begins because a later positive result may be treatment-related.

It may also be ordered to investigate unexplained hypoglycemia or insulin results that do not match the clinical picture. In these situations, it is interpreted with tests such as blood glucose, insulin and C-peptide, ideally collected during low glucose.

The test is not normally used to adjust insulin doses or monitor everyday diabetes control. Glucose readings, continuous glucose monitoring and HbA1c are more useful for those purposes.

Who should have the test

This is a specialist test, not a routine screening test. It may be appropriate if you:

A positive result without relevant symptoms or other findings does not establish diabetes or an insulin antibody disorder.

- Are being assessed for type 1 diabetes before starting insulin
- Have repeated or unexplained hypoglycemia
- Have unusually high insulin results that conflict with other findings
- Use insulin and have difficult-to-explain glucose changes
- Need further investigation after another diabetes autoantibody result

How to prepare

Fasting is not usually required for the antibody test alone. You can generally eat and take your usual medicines unless told otherwise.

Instructions may differ if testing is part of a supervised fast or hypoglycemia investigation. Follow the testing service's directions carefully. Do not attempt a prolonged fast on your own.

Tell the clinician or laboratory:

Do not stop insulin unless a specialist has provided a specific, supervised plan. Stopping insulin can be dangerous.

- Whether you currently use insulin or have used it previously
- When insulin treatment began
- Which insulin products you use and when you last took them

- Whether you take medicines that affect the immune system
- Whether other blood tests are being collected

What happens during the test

A healthcare professional draws blood from a vein, usually in your arm. The skin is cleaned and a small needle is used to collect the sample. The blood draw usually takes less than 10 minutes.

Several tubes may be needed if other tests are being performed during a low-glucose episode. Because some laboratories send samples to a specialist centre, results may take several days or longer.

Understanding your results

Results may be reported as positive or negative, or as a concentration, index or titre. Reference ranges, units and cut-offs differ between laboratories.

A positive result means insulin-binding antibodies were detected. It does not show why they developed or prove they are causing glucose changes.

Before insulin treatment, a positive result may support autoimmune type 1 diabetes when combined with glucose findings and other diabetes autoantibodies. After treatment begins, it may instead reflect antibodies produced in response to injected insulin.

During a hypoglycemia investigation, a positive result may support an antibody-related cause, but symptoms and accompanying glucose, insulin and C-peptide results remain essential.

A negative result means antibodies were not detected above the laboratory cut-off. It does not rule out type 1 diabetes or fully exclude an antibody-related problem, because levels may be low or the test may not detect a particular antibody well.

What affects the results

Current or previous insulin treatment is the main consideration. Routine tests may not distinguish antibodies caused by treatment from naturally occurring autoantibodies, so the date treatment began is important.

When hypoglycemia is being investigated, accompanying glucose, insulin and C-peptide samples are most informative if collected while glucose is low.

Laboratory methods vary and may detect different antibodies. Results from separate laboratories may therefore not be directly comparable. Antibodies may also make insulin measurements appear unexpectedly high by causing a test to measure antibody-bound insulin.

Immune-suppressing medicines or treatments that remove antibodies may reduce detectable levels. Age also affects interpretation because insulin autoantibodies are especially relevant in young children.

Eating, coffee, exercise and time of day do not usually change antibody levels directly, although they may affect glucose and insulin measured at the same time.

Accuracy and limitations

No single method detects every clinically important insulin antibody. A test can miss antibodies below its cut-off or antibodies that its method does not bind well. A negative result therefore cannot exclude type 1 diabetes or every antibody-related cause of hypoglycemia.

A positive result may also occur when antibodies are not causing illness, particularly after insulin treatment.

For suspected type 1 diabetes, a panel including GAD65, IA-2 and ZnT8 antibodies is generally more informative than this test alone. Glucose and HbA1c are needed to determine whether diabetes is present.

For unexplained hypoglycemia, additional tests may include glucose, insulin, C-peptide, proinsulin, beta-hydroxybutyrate and screening for glucose-lowering medicines. Specialist techniques may be needed when antibodies appear to distort insulin measurements.

Risks and complications

Possible effects of the blood draw include brief discomfort, bruising or feeling faint. Serious complications are uncommon.

Tell the person taking the sample if you have previously fainted during blood tests or take medicines that increase bleeding.

What happens next

Your clinician will review the result alongside your insulin-treatment history and related glucose, insulin, C-peptide or autoantibody tests. Follow-up may include further laboratory

tests, review of glucose records or an endocrinology appointment.

A positive result does not automatically require treatment. Management depends on whether antibodies are linked to diabetes, hypoglycemia or misleading insulin measurements.

Seek urgent medical help for severe hypoglycemia symptoms such as marked confusion, a seizure, loss of consciousness or inability to swallow safely. Someone who is unconscious or having a seizure needs emergency assistance; do not give food or drink by mouth.

Common questions

Can I drink coffee before the test?

Usually, if only the antibody test is being collected. If you were told to fast for other tests, consume only what the testing service permits; black coffee may not be allowed.

Does the time of day matter?

Not for the antibody measurement itself. Timing matters if blood must be collected during low glucose or a supervised fast.

Can I exercise beforehand?

Ordinary activity does not usually alter antibody levels. Exercise can affect glucose, so follow any instructions provided when glucose and insulin are also being measured.

Should I stop taking insulin before the test?

No. Do not stop or delay insulin unless a specialist has given you a supervised plan. Stopping insulin will not immediately remove existing antibodies and may be dangerous.

Does a positive result mean I have type 1 diabetes?

No. It may support type 1 diabetes when detected before insulin treatment and alongside other evidence. After insulin exposure, it may be treatment-related.

Can the test explain every episode of low blood glucose?

No. A positive result does not prove that antibodies caused an episode. Tests collected while glucose is low are often needed to identify the cause.

Sources

- Mayo Clinic Laboratories: Insulin Antibodies, Serum
- ARUP Consult: Diabetes-Associated Autoantibodies

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- Endotext: Hypoglycemia