TEST

Delta-ala urine test

A urine test that measures a chemical involved in making heme.

WHAT IT MEASURES
Delta-aminolevulinic acid, a chemical used to make heme

SAMPLE
Urine

FASTING NEEDED?
No

HOW LONG IT TAKES
A few minutes, or a 24-hour home collection

RESULTS IN
Several days, depending on laboratory and testing method

USED FOR
Supporting diagnosis of porphyria or lead exposure

MAIN LIMITATION
Incomplete 24-hour collection can falsely lower the result

Overview

The delta-ALA urine test measures delta-aminolevulinic acid in urine. Delta-ALA is an early building block of heme, the iron-containing part of haemoglobin and several other proteins.

Certain conditions interrupt the pathway that turns delta-ALA into heme. Delta-ALA may then build up and pass into the urine.

The test is mainly used when investigating an acute hepatic porphyria, a group of uncommon inherited conditions affecting heme production in the liver. It may also be used when lead exposure is suspected, although a blood lead level is the main test for diagnosing and monitoring lead exposure.

The sample may be a single urine specimen or urine collected over 24 hours. Results may be reported as a concentration, compared with urine creatinine or calculated as the total amount passed in 24 hours.

Why the test is ordered

A clinician may order this test when symptoms and medical history suggest disrupted heme production.

Possible symptoms of acute hepatic porphyria include severe unexplained abdominal pain, nausea, constipation, muscle weakness, confusion or dark urine. Testing is most useful while symptoms are happening. Because these symptoms have many other causes, delta-ALA cannot establish a diagnosis by itself.

Urine delta-ALA is usually measured with porphobilinogen, or PBG, another chemical in the heme pathway. Measuring both provides more useful information than delta-ALA alone.

The test may also form part of an evaluation for lead exposure. Lead interferes with heme production and can raise urine delta-ALA, but this test cannot show how much lead is in the body or replace a blood lead test.

Who should have the test

This is not a routine screening test for people without symptoms or a relevant exposure history. It may be appropriate if a clinician suspects an acute porphyria because of symptoms, family history or previous results.

It may also be ordered after possible lead exposure through work, hobbies, contaminated products or an older home. Blood lead testing is generally more direct.

People already diagnosed with porphyria may sometimes have delta-ALA measured during follow-up. Testing depends on the type of porphyria and any treatment being used.

How to prepare

Fasting is not usually required. Eat and drink normally unless the laboratory gives different instructions.

Tell the clinician about all prescription medicines, non-prescription medicines and supplements. Some medicines can affect porphyria symptoms or the interpretation of results. Do not stop any medicine unless the prescriber tells you to.

For a timed collection, obtain the correct container and instructions beforehand. The laboratory may require refrigeration and protection from light. Follow its directions closely.

Avoid dehydration. Concentrated urine can make a spot-sample result appear higher, although comparing delta-ALA with urine creatinine may reduce this effect.

What happens during the test

For a single sample, you urinate into a clean collection container. This takes only a few minutes.

For a 24-hour collection, you will usually:

If you miss any urine, tell the laboratory. An incomplete collection can make the result falsely low, and you may need to restart.

Keep toilet paper, stool and menstrual blood out of the container. Wash your hands after handling it.

- Empty your bladder at the starting time without collecting that urine
- Record the starting time
- Collect all urine passed during the next 24 hours
- Include a final sample at the same time the following day
- Store the container as instructed

Understanding your results

The report may show delta-ALA as an amount per litre, an amount relative to creatinine or a total collected over 24 hours. These formats are not directly interchangeable.

Reference ranges vary by laboratory and testing method. Interpretation may also be affected by age, pregnancy, kidney function, medicines and the reason for testing. Use the range on your report rather than one found online.

A raised result means more delta-ALA than expected was found. This can occur during an acute hepatic porphyria attack, after significant lead exposure or with some uncommon disorders of heme metabolism. It does not identify the cause by itself.

A result within range may make an acute porphyria attack less likely if the sample was collected correctly during active symptoms. A sample collected between episodes may be less informative. Results should be considered alongside PBG, urine creatinine and other findings.

What affects the results

Factors that can change or complicate the result include:

Exercise is not a major direct interference, but strenuous activity can cause dehydration. Iron deficiency and recent blood transfusion are not usually direct interferences, although they may

matter when investigating anaemia or lead exposure.

- Collection timing: Delta-ALA is more likely to be raised during an acute porphyria episode
- Missed urine: An incomplete 24-hour collection can produce a falsely low total
- Hydration: Dehydration concentrates a spot sample, while heavy fluid intake dilutes it
- Storage problems: Delayed delivery or incorrect temperature and light exposure may reduce sample quality
- Kidney function: Reduced kidney function may alter clearance and complicate interpretation
- Lead exposure: Lead can cause a genuine increase that may be mistaken for porphyria without further testing
- Medicines: Some medicines can trigger symptoms in susceptible people

Accuracy and limitations

A correctly collected result can show whether delta-ALA is increased, but it cannot diagnose a specific condition alone.

The test may miss an intermittent problem if collected when you are well. An incomplete collection, very dilute urine or poor storage can also produce a lower-than-expected result.

A raised result does not necessarily mean acute porphyria. Lead exposure, ALAD-deficiency porphyria and hereditary tyrosinaemia type 1 can also increase delta-ALA.

For suspected acute hepatic porphyria, a spot urine sample measuring both delta-ALA and PBG, adjusted for creatinine, is often more useful than delta-ALA alone. Further biochemical or genetic testing may determine the type.

For suspected lead exposure, a blood lead level is the better test. Urine delta-ALA cannot rule out lower-level exposure or measure the blood lead concentration.

Risks and complications

Providing a urine sample does not involve needles, radiation or sedation. There is no direct physical risk beyond inconvenience or accidental contact with urine.

A 24-hour collection can be awkward, particularly away from home. Correct storage and handwashing help keep the process hygienic.

What happens next

A result within range may need no further action if symptoms have resolved and other findings are reassuring. If suspicion remains high, testing may be repeated during symptoms or combined with PBG and other porphyria tests.

A raised result usually leads to further testing rather than an immediate diagnosis. This may include repeat urine testing, a blood lead level, blood or stool porphyrin tests, or genetic testing.

Arrange follow-up with the clinician who ordered the test to discuss the result in context.

Do not wait for the result if you develop severe or rapidly worsening symptoms. Seek urgent medical care for severe abdominal pain with repeated vomiting, new marked weakness, confusion or difficulty breathing. Call emergency services for a seizure, collapse or severe breathing difficulty.

Common questions

Can I drink coffee before the test?

Usually, yes. Fasting is not normally required. Follow any specific laboratory instructions.

Does the time of day matter?

It matters for timed collections and when symptoms occur. Start and finish a 24-hour collection at the instructed times. For suspected acute porphyria, collect the sample while symptoms are active if advised.

Can I exercise beforehand?

Ordinary activity is unlikely to affect the test directly. Avoid dehydration, especially after strenuous exercise.

Can I take my medicines?

Usually, yes. Do not stop prescribed medicines without advice. Provide a complete list of medicines and supplements.

What if I miss one sample during a 24-hour collection?

Contact the laboratory. Even one missed sample can make the total falsely low, and you may need to restart.

Do I need to keep the urine in the fridge?

Many laboratories require timed urine to be refrigerated or kept cool. Follow the storage and

light-protection instructions supplied with your container.

Sources

- MedlinePlus Medical Encyclopedia: Delta-ALA urine test
- Mayo Clinic Laboratories: Aminolevulinic Acid, 24 Hour, Urine
- ARUP Consult: Porphyrias
- American Gastroenterological Association Clinical Practice Update on Diagnosis and Management of Acute Hepatic Porphyrias
- Centers for Disease Control and Prevention: Testing for Lead Poisoning in Children