

ALT Blood Test

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Abstract

Alanine transaminase (ALT) is a transaminase enzyme (EC 2.6.1.2). It is also called alanine aminotransferase (ALAT) and was formerly called serum glutamate-pyruvate transaminase (SGPT) or serum glutamic-pyruvic transaminase (SGPT) and was first characterized in the mid-1950s by Arthur Karmen and colleagues. ALT is found in plasma and in various body tissues but is most common in the liver. It catalyzes the two parts of the alanine cycle. Serum ALT level, serum AST (aspartate transaminase) level, and their ratio (AST/ALT ratio) are commonly measured clinically as biomarkers for liver health. The tests are part of blood panels.

Keywords: Introduction, Function, Clinical Significance, Elevated levels, uses, causes, risk factors, conclusion

Introduction

A blood test is when a sample of blood is taken from the body to be tested in a lab. Doctors order blood tests to check things such as the levels of glucose, hemoglobin, or white blood cells. This can help them detect problems like a disease or medical condition. Sometimes, blood tests can help them see how well an organ (such as the liver or kidneys) is working.

ALT, which stands for alanine transaminase, is an enzyme found mostly in the liver. When liver cells are damaged, they release ALT into the bloodstream. An ALT test measures the amount of ALT in the blood. High levels of ALT in the blood can indicate a liver problem, even before you have signs of liver disease, such as jaundice, a condition that causes patient skin and eyes to turn yellow. An ALT blood test may be helpful in early detection of liver disease.

Other names: Alanine Transaminase (ALT), SGPT, Serum Glutamic-Pyruvic Transaminase, GPT.

Function

ALT catalyzes the transfer of an amino group from L-alanine to α -ketoglutarate, the products of this reversible transamination reaction being pyruvate and L-glutamate.

$L\text{-alanine} + \alpha\text{-ketoglutarate} \rightleftharpoons \text{pyruvate} + L\text{-glutamate}$

ALT (and all aminotransferases) require the coenzyme pyridoxal phosphate, which is converted into pyridoxamine in the first phase of the reaction, when an amino acid is converted into a keto acid.

Clinical Significance

ALT is commonly measured clinically as part of liver function tests and is a component of the AST/ALT ratio. When used in diagnostics, it is almost always measured in international units/liter (IU/L) or μkat . While sources vary on specific reference range values for patients, 0-40 IU/L is the standard reference range for experimental studies.

Elevated levels

Test results should always be interpreted using the reference range from the laboratory that produced the result. Normal levels of ALT ranges from about 7-56 units/liter, and 10-40 units/liters for AST. Elevated levels of AST and ALT may signify the level of liver damage in a person. However typical reference intervals for ALT are:

Female: ≤ 34 IU/L Ranges and Male: ≤ 45 IU/L Ranges.

Significantly elevated levels of ALT (SGPT) often suggest the existence of other medical problems such as viral hepatitis, diabetes, congestive heart failure, liver damage, bile duct problems, infectious mononucleosis, or myopathy, so ALT is commonly used as a way of screening for liver problems. Elevated ALT may also be caused by dietary choline deficiency. However, elevated levels of ALT do not automatically mean that medical problems exist. Fluctuation of ALT levels is normal over the course of the day, and they can also increase in response to strenuous physical exercise. When elevated ALT levels are found in the blood, the possible underlying causes can be further narrowed down by measuring other enzymes. For example, elevated ALT levels due to hepatocyte damage can be distinguished from bile duct problems by measuring alkaline phosphatase. Also, myopathy-related elevations in ALT should be suspected when the aspartate transaminase (AST) is greater than ALT; the possibility of muscle disease causing elevations in liver tests can be further explored by measuring muscle enzymes, including creatine kinase. Many drugs may elevate ALT levels, including zileuton, omega-3 acid ethyl esters (Lovaza), anti-inflammatory drugs, antibiotics, cholesterol medications, some antipsychotics such as risperidone, and anticonvulsants. Paracetamol (acetaminophen) may also elevate ALT levels. For years, the American Red Cross used ALT testing as part of the battery of tests to ensure the safety of its blood supply by deferring donors with elevated ALT

Levels. The intent was to identify donors potentially infected with hepatitis C because no specific test for that disease was available at the time. Prior to July 1992, widespread blood donation testing in the USA for hepatitis C was not carried out by major blood banks. With the introduction of second-generation ELISA antibody tests for hepatitis C, the Red Cross changed the ALT policy. As of July 2003, donors previously disqualified for elevated ALT levels and no other reason may be reinstated as donors when they contact the donor-counseling department of their regional Red Cross organization. In 2000, the American Association for Clinical Chemistry determined that the appropriate terminology for AST and ALT are aspartate aminotransferase and alanine aminotransferase. The term transaminase is outdated and no longer used in liver disease.

Uses

An ALT blood test is a type of liver function test. Liver function tests may be part of a regular check-up. The test can also help diagnose liver problems.

ALT blood test

Health care provider may have ordered liver function tests, including an ALT blood test, as part of a routine exam or symptoms of liver damage. These may include:

Nausea and vomiting

Jaundice

Abdominal pain

Loss of appetite

Unusual itching

Tiredness

Because ALT in the bloodstream can indicate liver damage before symptoms appear, health care provider may order an ALT blood test at a higher risk for liver damage. Risk factors for liver disease include:

Family history of liver disease

Heavy drinking

Exposure or possible exposure to hepatitis virus

Obesity

Diabetes

Taking certain medicines that can cause liver damage

During an ALT blood test

A health care professional will take a blood sample from a patient vein in arm, using a small needle. After the needle is inserted, a small amount of blood will be collected into a test tube or vial. Patient may feel a little sting when the needle goes in or out. This usually takes less than five minutes.

Need to do anything to prepare for the test

Don't need any special preparations for an ALT blood test. If patients health care provider has ordered more tests on your blood sample, may need to fast (not eat or drink) for several hours before the test. Your health care provider will let know if there are any special instructions to follow.

Risk Factors

There is very little risk to having a blood test. Patient may have slight pain or bruising at the spot where the needle was put in, but most symptoms go away quickly.

Results

An ALT blood test is often part of liver function testing. Liver function tests measure several different proteins, substances, and enzymes and can determine how well liver is working. Patient health care provider may compare your ALT results with the results of other liver tests to help learn more about patient liver function. High levels of ALT may indicate liver damage from hepatitis, infection, cirrhosis, liver cancer, or other liver diseases. Other factors, including medicines, can affect results. Be sure to tell health care provider about all the prescription and over-the counter medicines are taking.

Conclusion

ALT used to be called SGPT, which stands for serum glutamic-pyruvic transaminase. The ALT blood test was formerly known as the SGPT test.

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