Alanine Transaminase (ALT) Test

- Measures ALT, an enzyme released when liver cells are damaged; elevated levels indicate liver injury.

An elevation in serum ALT levels signifies clear liver cell damage resulting from various factors.[1] While certain liver diseases are linked to increased ALT levels, there is no direct relationship between the highest ALT elevation and the extent of liver damage.[2] It is common to observe simultaneous increases in both AST and ALT levels. ALT levels exceeding 1000 U/L should raise suspicion for acute ischemic liver injury, severe drug-induced liver injury, or acute viral hepatitis. Other potential causes include common bile duct obstruction and hepatitis E infection.[3]

Viral hepatitis refers to liver inflammation caused by hepatitis A, B, C, D, and E viruses. Acute hepatitis A typically results in higher serum ALT and AST levels compared to hepatitis C and B, with values reaching between 3000 and 4000 IU/L. In cases of chronic hepatitis, ALT levels remain elevated for more than six months.[4] Common symptoms associated with viral hepatitis include jaundice, loss of appetite, fatigue, vomiting, fever, nausea, and liver enlargement. Risk factors for contracting viral hepatitis include travel to endemic regions, having multiple sexual partners, exposure to chemicals and hepatotoxic substances in the workplace, and intravenous drug use. Hepatitis serology tests should be conducted to confirm the diagnosis and identify the specific type of viral hepatitis. The optimal aminotransferase threshold for diagnosing acute liver injury is seven times the upper limit of normal, with a sensitivity and specificity exceeding 95%. In cases of acute viral hepatitis, peak transaminase activity typically occurs between the 7th and 12th days, followed by a gradual decline, returning to normal levels by the 3rd to 5th week if recovery proceeds without complications.[5] The peak enzyme levels do not correlate with prognosis and may decrease even as the patient's condition deteriorates, potentially due to a reduction in functional hepatocytes available to release the enzymes.[6]

References

1. Peralta C, Jiménez-Castro MB, Gracia-Sancho J. Hepatic ischemia and reperfusion injury: effects on the liver sinusoidal milieu. J Hepatol. 2013 Nov;59(5):1094-106.
2. Gowda S, Desai PB, Hull VV, Math AA, Vernekar SN, Kulkarni SS. A review on laboratory liver function tests. Pan Afr Med J. 2009 Nov 22; 3:17.
3. Galvin Z, McDonough A, Ryan J, Stewart S. Blood alanine aminotransferase levels >1,000 IU/l - causes and outcomes. Clin Med (Lond). 2015 Jun;15(3):244-7.
4. Abutaleb A, Kottilil S. Hepatitis A: Epidemiology, Natural History, Unusual Clinical Manifestations, and Prevention. Gastroenterol Clin North Am. 2020 Jun;49(2):191-199.
5. Seto DS. Viral hepatitis. Pediatr Clin North Am. 1979 May;26(2):305-14.
6. Schwarz KB, Balistreri W. Viral hepatitis. J Pediatr Gastroenterol Nutr. 2002;35 Suppl 1: S29-32.