SydPath
ST VINCENT'S PATHOLOGY

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ALANINE AMINOTRANSFERASE (ALT)

INFORMATION SHEET

PHYSIOLOGY

ALT (Alanine aminotransferase) is an enzyme with transaminase activity which is found in highest concentrations in the liver and the kidney. Lesser amounts are also found in the pancreas, red blood cells and skeletal muscle. ALT catalyses the transfer of an ammonia group (NH_3) from alanine to alpha-ketoglutarate, producing pyruvate and glutamate. ALT is found in the hepatocyte cytosol and has a half-life in plasma of about 60 hours. Average within-person variation (CVi) in serum activity is about 20%. ALT has been previously known as Serum Glutamic Pyruvic Transaminase (SGPT) and the Enzyme Commission reference is EC 2.6.1.2.

PATHOLOGY

Raised levels of ALT may be found in the circulation in patients with acute or chronic liver damage from any cause. ALT and AST elevations may both indicate damage to hepatocytes although ALT is more specific than AST for liver disease. In cholestatic liver disease the ALT may be elevated but usually less than the elevation found in ALP and GGT. In rhabdomyolysis ALT may be elevated, but to a much lesser extent than the elevations in CK and AST.

REFERENCE INTERVALS

The recommended upper reference limits from the RCPA/AACB are as follows (these upper reference limits are for ALT assays without pyridoxyl phosphate used in the assay and are used for all ages at SydPath):

Males: 40 U/L Females: 35 U/L

CAUSES OF ELEVATED SERUM ALT

- Any cause of hepatitis (hepatocellular damage)
  - Acute or chronic viral infections (eg Hepatitis A, B, C; EBV)
  - Toxic injury from drugs or chemicals (may be dose-dependent or idiosyncratic)
  - Alcoholic hepatitis (AST commonly higher than ALT)
  - Hypoxic hepatitis (marked by rapid fall in levels after restoration of blood supply)
  - Primary or metastatic malignant neoplasms
  - Heart failure
  - Autoimmune hepatitis (test with LKM antibodies)
  - Collagen vascular diseases: SLE
  - Granulomatous diseases
  - Fatty liver

- Cirrhosis (often only modest elevations)
- Biliary obstruction (ALP and GGT more elevated)
- Rhabdomyolysis (CK and AST markedly more elevated)
- Inherited disorders (e.g. haemochromatosis, Wilson's disease, alpha-1-antitrypsin deficiency)
- Renal infarct