

Estimation of AST and ALT activity

Presented By

Lecturer

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What is transamination?

- It is a process in which alpha amino group from an amino acid is transferred to an alpha keto acid
- It is catalyzed by the enzymes **aminotransferases** and the coenzyme **pyridoxal phosphate**
- **Glutamate** is one of the reaction partners

- **Only threonine and lysine do not derive their amino groups by the transamination reaction**

What are types of aminotransferases?

- **Aspartate aminotransferase (AST) or (GOT)**
- **Alanine aminotransferase (ALT) or (GPT)**
- **AST is found in the cytoplasm and mitochondria of liver, heart, skeletal muscle, kidney, pancreas and lesser extent in RBCs.**

Causes of raised AST activities:

- **Artefactual:**

In vitro release from enterocyte in hemolysis or separation of plasma from cells is delayed

- **Physiological:**

During neonatal period (about 1.5 times normal)

- **Marked increase (10-100 times normal)**

- **Circulatory failure with shock and hypoxia**

- **MI**

- **Acute viral or toxic hepatitis**

- **Moderate increase:**
 - **Cirrhosis**
 - **Infectious mononucleosis**
 - **Cholestatic jaundice**
 - **Malignant infiltration of liver**
 - **Skeletal muscle disease**
 - **After trauma or surgery**
 - **Sever hemolytic episode**

- **There is a high correlation between MI and AST but it must be measured with other tests including CPK and LDH, because of its low organ specificity.**

- **ALT appears primarily in hepatocellular cytoplasm with lesser amount in kidney, heart, skeletal muscles, therefore it is more sensitive indicator of acute hepatocellular damage in which it is released to the bloodstream and cause jaundice then return to normal within days or weeks**
- **It is twice higher in infants than in adults**

Causes of raised plasma ALT:

- **Marked increase: (10-100 times normal)**
 - **Circulatory failure with shock and hypoxia**
 - **Acute viral or toxic hepatitis**
- **Moderate increase:**
 - **Cirrhosis**
 - **Infectious mononucleosis**
 - **Liver congestion in CHF**
 - **Cholestatic jaundice**
 - **Surgery or trauma and skeletal muscle disease (less than AST)**

What is GOT/GPT ratio?

- It is obtained by dividing GOT/GPT
- Its normal range 1-1.3
- It is changed in certain diseases where cell membranes permeability is increased (ratio decreases) or in cellular damage (ratio increases)

What are medications that affect aminotransferases level?

- **Pain relief medications:**

- **Aspirin**
- **Acetaminophen**
- **Diclofenac**

- **Anti-seizures:**

- **Phenytoin**
- **Carbamazepin**
- **phenobarbital**



- **Antibiotics:**
 - **Tetracyclin**
 - **Sulphonamides**
- **Cholesterol lowering drugs:**
 - **Statins**
 - **Niacin**
- **Cardiovascular drugs:**
 - **Amiodarone**
 - **Hydralazine**
- **Tricyclic antidepressants**

Thank
you!

