COMPARATIVE STUDY ON SERUM ENZYME LEVELS IN VARIOUS LIVER DISEASES

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ABSTRACT

This is a comparative study on serum enzyme levels in various liver diseases. Serum alkaline phosphatase, gamma glutamyl transferase, alanine and aspartate amino transferases were estimated in viral hepatitis, alcoholic liver diseases, obstructive jaundice, cirrhosis of the liver. These enzymatic variations are useful to diagnose the disease and classify them according to etiology.

KEY WORDS: Gamma Glutamyl Transferase, Serum Alkaline Phosphatase, cirrhosis of liver, alcoholic liver disease

A few tests have been devised for the detection of alterations in hepatic functions out of which the measurement of serum enzyme activity is very important in clinical cases (Varley, 1988; Bigoniya et al, 2009; Kataria et al, 2011). All the enzymes namely GGT, ALP, SGOT, SGPT are useful parameters for diagnosis of various liver diseases (Colledge et al, 2010).

SGPT (Serum Glutamic Pyruvate Transaminase; it is also commonly known as Alanine Transaminase, abbreviated as ALT) is present in high concentration in the liver and to a lesser extent in kidney, heart, skeletal muscle, pancreas and lung. Increased levels are generally a result of primary liver disease such as cirrhosis, carcinoma, viral or toxic hepatitis. Decreased levels may be observed in renal dialysis patients and with vitamin B6 deficiency (Varley, 1975; Bradley et al, 1972; Wolf et al, 1972).

SGOT (Serum Glutamic Oxaloacetic Transaminase; is also called aspartate aminotransferase-AST) occurs in all human tissues and is present in large amount in liver, renal, cardiac, and skeletal muscle tissue. Increased levels are associated with liver disease or damage myocardial infarction, muscula dystrophy and cholecystitis. Decreased levels are observed in undergoing renal dialysis and those with B6 deficiency (Bergmeyer et al, 1985; Ellis et al, 1978; Tietz & Amerson, 1990).

ALP (Serum Alkaline Phosphatase) is found in practically all tissues of the body but in higher concentrations in the osteoblasts of bone, liver placenta, kidney, and lactating mammary glands. Increase ALP is seen in osteomalacia and rickets, low levels of ALP may be observed in conditions which causes arrested bone growth or in
Elevated levels of Gamma Glutamyl Transferase (GGT) are observed in chronic alcoholism, pancreatic disease, myocardial infarction, renal failure, chronic obstructive pulmonary disease, and in diabetes mellitus. In liver diseases GGT elevation parallels that of ALP and is very sensitive of biliary track disease. The GGT level in alcoholic liver disease roughly parallels the alcoholic intake. GGT elevation parallels that of ALP and is sensitive of biliary track disease. GGT is key enzyme for diagnosis of alcoholic liver disease (Fauci et al, 2008).

The aim of the present investigation was to study these enzymes in various types of liver diseases to assess their diagnostic importance (Raghavendra & Srinivas Rao, 2000; Vasudevan & Sreekumari, 2005).

The present study was done in Fathima Institute of Medical Sciences, Kadapa (Mahaboob et al, 2013). SGPT was estimated by International Federation of Clinical Chemistry (IFCC) method kinetic (Varley, 1975; Bradley et al, 1972; Wolf et al, 1972). SGOT was estimated by IFCC method kinetic without pyridoxal phosphate (Bergmeyer et al, 1985; Ellis et al, 1978; Tietz & Amerson, 1990). ALP was estimated by P-Nitro phenyl phosphate method (Zilva & Pannall, 1979; Tietz et al, 1983; Young, 1990; Kaplan & Pesce, 1989). Serum Gamma GT was estimated by kinetic method.

Fig.1. Serum enzymes levels in various liver diseases

Higher levels of ALP and GGT were observed in serum in all cases of alcoholic liver disease. However, the latter showed an average increase of about 6 times their mean normal values which was much higher than that of GGT in all cases of alcoholic liver disease. Comparing the significance of GGT and ALP in alcoholic liver disease, the former seemed to be a better parameter for diagnosis. SGPT and SGOT levels in serum increased to 6 times the normal value in viral hepatitis where as the levels of ALP increased only 3 times the normal value. The much higher increase of SGPT compared to SGOT suggests the former to be a better index of viral hepatitis. Mild elevation in serum levels of both enzymes was observed in most of the other cases of liver disease through significant increase was only seen in viral hepatitis. ALP levels in serum increased to 6 times the normal value in obstructive jaundice, it is a key
enzyme for the diagnosis of the obstructive jaundice. In conclusion it shows that levels of GGT are more use full than ALP for diagnosis of alcoholic liver disease and SGPT is definitely a better index of viral hepatitis than SGOT (Walsh & Alexander, 2000; Popescu et al, 2010; Salma Mahaboob et al, 2013). The present work supports their inclusion and use as reliable tests for diagnosis of specific liver disease.

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REFERENCES

• Zilva JF, Pannall PR. 1979. Plasma Enzymes in Diagnosis. in Clinical chemistry in Diagnosis and treatment. Lloyd London, Chapter 15