

RESEARCH TITLE

ALT, AST, ALP AND VIRAL HEPATITIS IN RENAL FAILURE PATIENTS

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Abstract

Viral hepatitis is a systemic, viral infection in which necrosis and inflammation of liver cells produce a characteristic cluster of clinical, biochemical, and cellular changes. The aim of this work was to determine the alteration of some enzymes level and changes in enzymes activity and its effect on the liver functions. The study revealed that viral hepatitis caused by HBV, HCV was found in 41% of patients, HBsAg was found in 18.52 % and anti-HCV in 22.22%. Liver function tests (ALT, AST, ALP) were done for all chronic renal failure patients; patients with hepatitis viruses had a mean concentration of ALT 37.23 ± 21.5 U/L while the mean of chronic renal failure patients without hepatitis was 96.45 ± 120.22 U/L and the highly concentration was observed in 31.4% (34/108) from cases. Chronic renal failure patients with hepatitis viruses had a mean concentration of AST 32.05 ± 11.76 U/L while the mean of chronic renal failure patients without hepatitis was 82.5 ± 109.73 U/L, the highly concentration were observed in 42.5% (46/108) from cases. Regarding to ALP the mean was 119 ± 72.97 U/L, 155.27 ± 63.73 U/L for CRF patients with hepatitis and without hepatitis respectively, highly concentration was observed in 15.7% (17/108) cases.

Key Words: Hepatitis, liver enzymes, hemodialysis, renal failure

1. Introduction Hepatitis can be demarcated as a medical condition that categorized by the inflammation of the liver with the presence of inflammatory cells in this organ, this condition may evolved to fibrosis or self-limiting (healing on its own)[1]. Liver Function Tests (LFTs) are one of the well-known requested screening blood tests. Classically they are used to give information on whether a patient's primary disorder is hepatic or cholestatic in origin [2]. Alanine Aminotransferase (ALT) is an enzyme that catalyzes the transference of amino-group of alanine to α -ketoglutarate, leading to the formation of pyruvate and glutamate[3]. in the past the enzyme was called serum glutamic pyruvate transaminase (SGPT)(4). Aspartate Aminotransferase (AST): The AST transfer amino-groups from glutamate to oxaloacetate, creating aspartate[3], in the past named as serum glutamic oxaloacetic transaminase (SGOT)[4]. Alkaline phosphatase: Alkaline phosphatase (ALP) is an enzyme that transport metabolites crossways the cell membranes[5]. In the liver ALP is found histochemically in the microvilli of bile canaliculi and on the sinusoidal surface of hepatocyte[4], also it may be originate from other tissues [5] . This study aims at studying the effect of continual dialysis attendance on some liver function tests of those with viral hepatitis B and or C.

2. Material and methods

2.1. blood samples was collected from 108 (81 males & 27 females) with a mean age of 50.5 year, age range 20-80 year with chronic renal failure undergoing hemodialysis (HD) at the hemodialysis unit.

2.2. The Determination of AST, ALT, ALP in serum done by the Abbott Architect c4000. The appropriated sample 1-35 μ l (average 7 μ l) of serum, maximum throughput 800 test/hour and it displays

analysis results automatically according to manufacturer's instruction (Diamond Diagnostics - USA)

2.3. The statistical analysis was obtained using the statistical packaye for Social Science (SPSS) version (18) and Microsoft Excel (2003) software's. Descriptive Statistics for all data of each set were expressed as mean \pm SD, and the present of abnormal value in any test was calculated as above or below the mean \pm SD of the normal values for the matched control group, were compared using independent sample(T)test

$p < 0.0001$, $p < 0.001$, $p < 0.01$ were considered statistically significant.

3. Results and Discussion

In current study, liver function tests (AST, ALT, ALP) that compared between CRF patients carrying hepatitis B or hepatitis C antibodies in their sera and those of no hepatitis. The data were shown in tables (1, 2, and 3) in pages 5 and 6. Significant statistical difference ($p < 0.05$) is found between both groups concerning AST, ALT and ALP. our study exposed highly significant difference according to the concentration of ALT between patients (CRF with hepatitis and CRF without hepatitis) (P- value 0.0018) where CRF patients with hepatitis viruses had a mean concentration of ALT 37.23U/L and the highly concentration were detected in 18.18% from cases, two from 20 patients of HBV with high concentration of AST (10%) where the highest one was 57 U/L and 6 /24 of HCV patients had high concentration of ALT(25%) where the highest one was 90 U/L, whereas the mean of CRF patients without hepatitis was 96.45U/L with a percentage 40.6(26/64). This was lesser than that described by Saadoon IH where raised ALT levels were found in patients with HBsAg and individuals with anti-HCV in similar rates(82% and 80.7% respectively), these biochemical tests might be associated with fibrosis [6]. Patients with chronic hepatitis

C and normal ALT levels showed lesser liver inflammation and fibrosis progression compared with patients with elevated ALT levels [7]. Further findings did not suggest that higher ALT values carry an increased risk of fibrosis [8]. Anti- HCV positive persons that had raised ALT level are expected to have significant liver disease than those who have normal serum ALT level [9], in healthy state hepatocytes are broken down and renewed, ALT levels remain within normal limits while in chronic HCV the occurrence of hepatocyte break down is rise because of viral infection. Extra damage to hepatocytes results in an extra release of ALT to the serum, so levels of ALT are increased in chronic hepatitis C, and after treatment with α - interferon its level decline to normal level [10]. Impaired immune response to viral infection leads to chronic hepatitis C with normal aminotransferase activity [11]. According to AST concentration there was highly significant difference between patients (CRF with hepatitis and CRF without hepatitis) (P-value 0.0032); CRF patients with hepatitis viruses had a mean concentration of AST 32.05 U/L, highly concentrations were observed in 45.45% (20/44) from cases, 6/20 of patients (30%) with HBV had high concentration of AST where the highest one was 61 U/L and 14 patients from 24 with HCV had high concentration of AST with percentage 58.3 where the highest one was 48 U/L, while the mean of CRF patients without hepatitis was 82.5 U/L with a percentage 40.6(26/64). Aspartate aminotransferase is found in the skeletal muscle, liver, kidney, heart, RBC and brain. clinical practice leading to raised AST duo to either cardiac or hepatocellular damage. In liver disease it should be correlated with ALT [12], on other hand Bdour [13] showed that the most anti-HCV positive patients had normal ALT and AST values indicating that transaminases are not sensitive indicators for on ongoing HCV replication in hemodialysis patients. One

research was carried out in this field revealed that almost 85 % of patients with HCV and insistently normal liver enzymes have got abnormal liver histology of variable degrees of severity [14]. Alkaline phosphatase is present in hepatocyte bound to hepatocyte membrane, in liver disease is elevated when there is obstruction in the biliary passageway [10]. Our study discovered significant statistical difference with p-value 0.015 between both groups regarding to ALP with mean 119 U/L, 155.27 U/L for CRF patients with hepatitis and in those free of hepatitis respectively, The highly concentration were observed in 25% (6/24) from cases in patients with HCV where the highest one was 332 U/L, persons with HBV had regular concentrations. Saadoon IH [6] was disagreed with this results who mentioned that ALP elevated in HBsAg positive patients in rate higher than that in anti-HCV-positive patients exclusively in progressive stages of liver disease. While HL Namat Allah [15] showed that the HCV infection was noticed just in one patient with hemodialysis and he had abnormal ALP level, and Abbass et al [10] verified that the ALP level persisted regular before and after treatment with α -interferon, as the chronic hepatitis in primary stages and there was no obstructive element.

4. Conclusion and Recommendations

Liver function tests value of CRF patients carrying hepatitis B or hepatitis C antibodies in their sera were lower than those of no hepatitis and there was a Significant statistical difference ($p < 0.05$) between both groups so that we recommended the using of liver, hematological, immunological tests and liver biopsy to evaluate the liver damage after hepatitis infection, Provide instruction to family members of hemodialysis patients to increase their knowledge about viral hepatitis.

Table (1): Comparison between ALT Results in Both Groups.

<i>Study group</i>	<i>Mean ALT± SD</i>	<i>T- test</i>	<i>Degree of Freedom (df)</i>	<i>Standard Error</i>	<i>P- value</i>
CRF patients with Hepatitis	37.23 ± 21.5	3.21	86	18.41	0.0018*
CRF patients without Hepatitis	96.45 ± 120.22				

* *Highly Significant*, the concentration unit of ALT is U/L.

Table (2): Comparison between AST Results in Both Groups.

<i>Study group</i>	<i>Mean AST± SD</i>	<i>T- test</i>	<i>Degree of Freedom (df)</i>	<i>Standard Error (SE)</i>	<i>P- value</i>
CRF patients with Hepatitis	32.05 ± 11.76	3.03	86	16.64	0.0032*
CRF patients without Hepatitis	82.5 ± 109.73				

* *Highly Significant*, the concentration unit of AST is U/L

Table (3): Comparison between ALP Results in Both Groups.

<i>Study group</i>	<i>Mean ALP ± SD</i>	<i>T- test</i>	<i>Degree of Freedom (df)</i>	<i>Standard Error</i>	<i>P- value</i>
CRF patients with Hepatitis	119 ± 72.97	2.48	86	14.6	0.015*
CRF patients without Hepatitis	155.27 ± 63.73				

* *Significant*, the concentration unit of ALP is U/L.

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