

Liver Enzymes in Patients With Chronic Kidney Diseases Undergoing Hemodialysis.

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Abstract :

Chronic Kidney Diseases(CKD) is a worldwide public health problem. Chronic renal failure patients requires treatment with dialysis or transplantation is the most visible outcome of CKD. The present study was aimed to determine the aspartate transaminase (AST) and alanine transaminase (ALT) levels with baseline parameters in patients with chronic kidney diseases. Total 85 patients were studied in between age group 40 to 70 years. After applying the inclusion and exclusion criteria, a total of 50 chronic kidney disease patients were eligible for the study. The data was collected and compared with 50 age and sex matched healthy controls from the same age group. The statistical analysis was done using SPSS 16.0 software. All the patients were assessed with baseline parameters like RBS (random blood sugar), blood urea, creatinine, total cholesterol and liver enzymes such as AST and ALT.

The concentrations of RBS, blood urea, creatinine, total cholesterol and were significantly elevated ($P<0.001$) and AST along with ALT were significantly declined when compared with control group. The serum transaminase levels were declined significantly in patients with kidney diseases on hemodialysis than normal renal function patients. It has a multifactorial origin.

Key Words- Chronic Kidney Diseases(CKD), Aspartate Transaminase (AST), Alanin Transaminase (ALT), Liver Enzymes.

Introduction : A chronic kidney disease (CKD) is worldwide public health problem. In the united states, there is a rising incidence and prevalence of kidney failure^[1,2]. The treatment for CKD transplantation which is having poor outcome and high cost^[3]. Chronic kidney failure (CRF) results from progressive and permanent destruction of nephrons, despite of the cause^[4]. Patients with CRF are a major cardiac population. ^[1]

The diagnosis implies that the glomerular filtration rate is known to have been reduced at least for 3 to 6 months. Often gradual decline in GFR occurs over a period of years^[4]. The serum levels of liver enzymes alanine transaminase, aspartate transaminase, gamma glutamine transaminase are markers of aggression against hepatocytes^[5]. They are elevated in many diseases. These enzymes assist in diagnosis and patients fallow-up and response to treatment. Because they reflect inflammatory activities in the parenchyma of the liver^[6]. The prevalence of the hepatitis C virus (HCV) infection is significantly higher in hemodialysis patients when compared with general population^[7].

Most of the studies show the lowered values of liver enzymes in CKD patients. The reason is unknown^[5].The objectives of the study were to assess the liver enzymes and it causes in the CKD patients on hemodialysis.

Material & Methods : The present work was carried out in the Department of Biochemistry, Govt. Medical College and Hospital, Vijayawada in collaboration with Arun Kidney Center (Corporate Hospital Vijayawada) Prior to start the study, local institutional ethical clearance was obtained and utmost care was taken during experimental procedure according to the Declaration of Helsinki 1964.

Total 85 patients were studied in between age group 40 to 70 years. After applying the inclusion and exclusion criteria, a total of 50 chronic kidney disease patients were eligible for the study. The data was collected and compared with 50 age and sex matched healthy controls from the same age group.

Study Type: Hospital based Case – Control Study.

Patients with chronic kidney Disease (CKD) and end stage renal disease patients were included in the study group.

The subjects who are having previous ischemic heart diseases, Patients undergoing per cutaneous coronary intervention, hyperthyroidism, trauma, liver diseases, recent cerebrovascular diseases, convulsions were excluded from the study.

A written consent forms were taken from all the participants. By giving detail information of study, blood samples were collected from controls as well as CKD patients. Random blood samples were collected into two clean bottles, one without anticoagulant and other with coagulant (sodium fluoride and potassium oxalate). Serum was separated taking precautions to avoid hemolysis from the first bottle and the following

tests were done..

1. Blood glucose (GOD – POD method)^[8].
2. Blood urea (Urease method)^[9].
3. Serum creatinine (Alkaline picrate method)^[10].
4. Serum total cholesterol (CHOD – POD)^[11].
5. Serum AST^[12,13,14].
6. Serum ALT^[12,13,14].

CK - MB was done on semi-automatic analyzer by kinetic method and blood urea, serum creatinine, total cholesterol and blood glucose by colorimetric method.

The statistical analysis was carried out by using the SPSS (Statistical Package for Social Sciences) statistical software, version 16.0 for Windows. The Student's 'Z' test were applied for the significance and the results were expressed in mean \pm SD. p values (p <0.001) were considered as highly significant.

Results :

Table No. -1. Shows the mean \pm SD values of AST, ALT and baseline biochemical parameters of controls and CKD patients.

Sr. No.	Biochemical parameters	Control (n=50) mean \pm SD	CKD(n=50) mean \pm SD	P value <
1	Serum RBS(mg/dl)	143.35 \pm 41.2	165.2 \pm 73.79*	0.001
2	Serum Urea (mg/dl)	32.21 \pm 6.87	90.89 \pm 35.78*	0.001
3	Serum Creatinine (mg/dl)	0.90 \pm 0.30	7.189 \pm 3.76*	0.001
4	Serum Cholesterol (mg/dl)	178.40 \pm 27.57	194.54 \pm 57.21*	0.001
5	Serum AST(IU/L)	27.43 \pm 4.78	15.56 \pm 7.34*	0.001
6	Serum ALT(IU/L)	33.98 \pm 3.65	14.34 \pm 5.98*	0.001

Values were expressed in mean \pm SD.

*indicates statistically significant (p<0.001)

n=number of patients.

Discussion : Liver enzymes are having diagnostic importance in severe kidney diseases (CKD) patients on hemodialysis. These are most commonly used in the assessments of diagnosis of hepatobiliary diseases. In our study the concentration of serum aminotransferases enzymes are fall in CKD patients when compared with healthy controls.

As per the study of Luis Herique Bezerra et al, that the serum AST and ALT levels were decreased in CKD patients undergoing hemodialysis. It was hypothesized

that this decline could be due to some factors such as withdrawal of amino transferases during the hemodialysis process. At the time of treatment of hemodialysis the NADPH is consumed rapidly^[5]. This leads to declines the concentrations of AST and ALT concentrations in the hemodialysis patients^[15,16].

Our study also supported with the study of Rahul A Nathwaniet al. that AST and ALT levels were reduced significantly in CKD patients when compared with normal renal function individuals. Due to pyridoxine deficiency and hemodilution are the major causes to deplete the levels of AST and ALT respectively^[17].

Conclusion : The depleted concentrations of AST and ALT were found in patients with chronic kidney disease who were on hemodialysis. This may be due to hemodilution, pyridoxine deficiency and increased homocysteine.

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