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Changes of Serum Transaminases in Chronic Alcoholics Undergoing Deaddiction Treatment

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ABSTRACT

Alcoholism is a major health issue with socioeconomic consequences. Clinicians can use cost effective and easily available biochemical measurements to objectively assess patients' current or past alcohol use. Commonly known as the liver enzymes, the serum aminotransferases include: aspartate aminotransferase (AST), alanine aminotransferase (ALT) which reflect liver injury due to excessive alcohol consumption.

The aim of this case control study was to estimate the transaminases (AST and ALT) and compare their levels in chronic alcoholics undergoing deaddiction treatment with apparently healthy age matched controls.

30 cases between 25-60 years of age, selected for the study in the inpatient unit of Dept.of de-addiction centre at Kamineni Institute of Medical Sciences, Narketpally. AST and ALT estimated by modified IFCC UV-Kinetic method by life chem Kit.

ALT, and AST in the serum were significantly higher in alcoholics before de-addiction which decreased significantly after one month and two months of alcohol withdrawal regimen. But the values did not reach normal control levels .Thus these changes of serum transaminases observed in chronic alcoholics offer use not only as diagnostic markers but also as prognostic markers and are helpful in management of chronic alcoholics.

Keywords- *Alanine aminotransferase, Aspartate aminotransferase, Alcoholics, Liver, Transaminases*

INTRODUCTION

Alcohol is well recognised as having systemic effects on the body involving all body systems. . The diagnosis is often based on the patient's self reporting of alcohol consumption, which is notoriously unreliable and requires a high degree of clinical suspicion[1]. The chronic consumption of alcohol causes multiple structural and functional derangements [2] Indeed, it has long been known that alcohol consumption is responsible for increased illness and death. Heavy alcohol consumption either directly causes or contributes to a wide range of serious health problems like fatty liver [3], alcoholic hepatitis, alcoholic cirrhosis and accidents that necessitate consumption of health care[4]. Liver plays a major role in the detoxification of toxic compounds such as alcohol that generate free radicals which aid in the alcohol mediated oxidative stress [5].

The identification of alcoholics, especially in the early stages of alcohol abuse is crucial in preventing adverse health effects and social consequences. Clinicians have seeked for long to get an accurate and inexpensive means of identifying persons who consume excessive amounts of alcohol. It is known fact that alcoholics can be differentiated reliably from non-alcoholics using traditional clinical laboratory tests like transaminases. Moreover, distinguishing alcoholic from non-alcoholic liver disease has important implications for treatment and management[6]. In the present study we have investigated changes in biochemical parameters in patients with alcoholic liver injury before, during and after the alcohol deaddiction treatment. These parameters were compared with normal values obtained from normal healthy people. Biochemical parameters included are transaminases.These enzymes metabolize amino acids and due to liver cell turnover, are found in the blood normally. The ALT and AST are felt to be an indicator of liver disease in general and less specific to alcohol induced liver damage. ALT is more specific to alcohol induced liver cell injury than AST which is also found in heart, muscle, kidney and brain cells. Any injury or disease that can increase the level of cellular injury or death in these organs will cause an elevation of these markers[7]

MATERIALS AND METHODS

This study was carried out in the department of Biochemistry in association with Deaddiction centre, Kamineni Institute of Medical Sciences, Nalgonda district, Telangana. The study protocol was approved by the institutional ethics committee.

The study group (Group-A) included (n=30) cases between 25-65years of age and consuming alcohol for 5-21 years admitted in the Deaddiction centre for alcohol withdrawal treatment. The study subjects were divided into. The diagnosis of the alcohol-dependence was done by the treating psychiatrist. A detailed history of alcohol intake, clinical complications and the use of tobacco were collected from the subjects. The same subjects were followed up after the treatment period of two months and were divided into three subgroups (A1,A2,A3) as shown in Table-1 .Age and sex matched, apparently healthy volunteers (n=30) attending health checkup camp were included as the controls(Group-B) in this study. Occasional drinkers, patients with systemic illness, smokers and

tobacco chewers, were excluded from the study. A written informed consent was obtained from each subject.

Five ml of random venous blood was collected by taking aseptic precautions and this was centrifuged to separate the serum. Estimation of aspartate amino transferase (AST) and alanine amino transferase (ALT) was done by modified IFCC UV Kinetic method. [8,9]

The significance of the differences in the values of the parameters among chronic alcoholics (group-A1,A2,A3) and controls (group-B), was evaluated by ANOVA (Analysis of Variance)

Table-1:Alcoholic cases divided based on duration of deaddiction treatment.

GROUP- A (Cases)	Duration of deaddiction treatment
GroupA1	Before start of treatment (0 duration)
GroupA2	1 month post treatment (30 days)
GroupA3	2 month post treatment (60 days)

RESULTS

It was observed that the activities of the enzymes, ALT and AST in the serum were significantly higher in the alcoholics(Group-A) in all the three subgroups(A1,A2,A3) as compared to those in the controls(Group-B) [Table;2/Figure;1].

The activities of these enzymes in the serum decreased significantly after one month and then later after two months of the alcohol withdrawal regimen.

All the results were statistically significant ($P < 0.001$).

Table-2; Comparision of serum enzyme levels in alcoholics and controls

Enzymes (Serum)	Cases(alcoholics)			Controls
	Group A1	Group A2	Group A3	Group B
AST (upto 37IU/l)	74.0±19.8*	65.7±18.1*	52.1±9.57 *	25.8±5.1
ALT (upto 40IU/l)	117.0±42*	99.7±33.2*	54.4±12.5 *	25.4±6.4

Note; Values are mean ± S.D. of number of samples indicated

*Significance of the difference when alcoholics are compared to controls ($p< 0.001$;Highly significant);

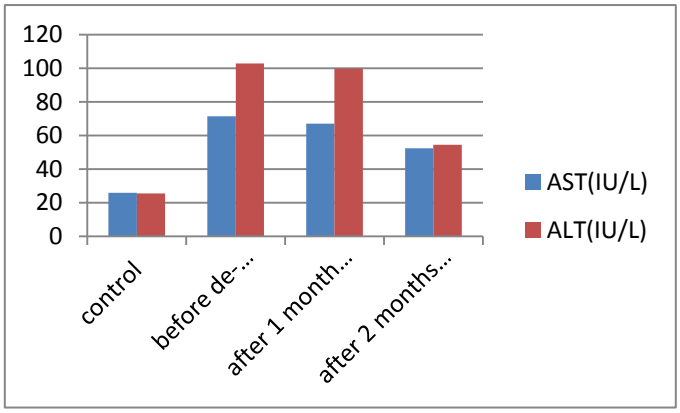

Figure-2: Comparison of serum AST, ALT (mean±sd) in cases at the time of admission before the start of de-addiction treatment, after 1 & 2 months post de-addiction treatment with controls

DISCUSSION

Transaminases (AST,ALT) are the traditional markers of alcoholism and alcoholic liver disease. The study includes 30 chronic alcoholics consuming alcohol for a period of 5-21 years.An attemptwas made to assess the effect of chronic alcoholism on the activities of ALT and AST in the serum after one and two months of alcohol deaddiction treatment.

The activity of aminotransferase AST was elevated in all subgroups of chronic alcoholics by 2.8 fold,2.5 fold,2 fold respectively in serum in comparision to controls. The activity of aminotransferase ALT was elevated in all subgroups of chronic alcoholics by 4.6 fold,3.9 fold,2.1 fold respectively in serum in comparision to controls. Liver disease is the most important cause of increased transaminase activity in serum. In most types of liver disease, ALT activity is higher than that of AST. The serum ALT and AST levels are known to become elevated in viral hepatitis and toxic hepatitis, cholestasis, cirrhosis, liver carcinoma, and alcoholic liver disease [10-12]. Any type of liver cell injury can reasonably increases ALT levels and observed most often in persons with liver diseases [7] as seen in our study .

Alatalo et al. [13] in their study demonstrated that the serum enzyme markers of alcohol abuse and liver function may respond to even rather low levels of alcohol intake. It was observed that the activities of the enzymes in the abstainers differed significantly from that of the controls. The transaminases did not reach the normal control levels after one month and even after two month of alcohol abstinence and deaddiction treatment, but showed an improving results, as demonstrated by a decrease in their activities when compared to their activities before the abstinence and treatment.

This indicates that more time is required for the enzymes to reach the normal control levels and thus, they can be used not only as prognostic markers to assess the liver injury. This would be helpful in the management of chronic alcoholics. Further studies are required to establish the corresponding ultrasound and liver biopsy reports on a larger sample size.

CONCLUSIONS

The changes of serum transaminases observed in chronic alcoholics offer use not only as diagnostic markers but also as prognostic markers and are helpful in management of chronic alcoholics.

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