



Case Report

Biochemical Studies of Alcohol Induced Liver Injury

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Received 26 July 2016; Accepted 30 August 2016; Published 15 September 2016

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Cite This Article: Chawla, C., Agarwal, U., Sharma, R., Kansal, D., (2016). Biochemical Studies of Alcohol Induced Liver Injury. BMR Medicine 3(1). 1-4

ABSTRACT

Liver damage is one of the most common consequences of alcohol abuse but despite of an enormous amount of research efforts, the mechanism by which alcohol causes alcoholic liver diseases remains unknown.

Evidence that association is independent of both alcohol consumption and changes in other liver function tests suggest that possible mechanisms beyond alcohol neurotoxicity and hepatic dysfunction deserve further investigation (Michael 1989)

The present study was envisioned to carry out Biochemical studies of alcohol induced liver injury in the alcoholic patient with following aims and objects.

- i. To determine the effect of alcohol on liver function
- ii. To know effect of alcohol on lipid profile.
- iii. To know the quantity, quality and duration of alcohol intake in relation to liver damage and change in lipid metabolism.
- iv. To observe the effect of diet in liver damage in alcoholic.

KEY WORDS: Alcohol, Liver Injury

INTRODUCTION

Enjoy a drink? Even scientist admit that an occasional alcoholic beverage may be enjoyed without harmful effects. It may not do good, but it will not impair health either. It is really a question of the amount consumed and the frequency with which one drinks plus the individuals own

metabolism. Every bit of alcohol burned in the tissues creates a nutritional demand for carbohydrates, vitamins, minerals, and other elements necessary to process it. If one has reserve of all those necessary elements then he is better off than the person who doesn't. (A.M Chut Nutritional moves Jan – Mar 1998).

Most of the alcohol which is absorbed (90%) is metabolized in the liver. There are three main enzyme systems involved in the initial oxidation of alcohol, all of which produce Acetaldehyde as the primary metabolic product

(i) Alcohol dehydrogenase in the cytosol.

(ii) MEOs (Microsomal ethanol oxidizing system) on the smooth endoplasmic reticulum and

(iii) Catalase and hydrogen peroxide in the mitochondria and peroxisomes. These reactions generate reduced NAD in the hepatocytes. In the presence of continuous alcohol abuse, an increase in the ratio NADH/NAD which changes the redox potential of the hepatocytes with consequential effects on other metabolic processes such as lipid and carbohydrate metabolism (Lieber, C.S.1985)

The three principal alcohol induced hepatic injury are designated as

(i) Alcoholic fatty liver

(ii) Alcoholic hepatitis

(iii) Alcoholic cirrhosis.

The deranged metabolic processes caused by alcoholic abuse produce the histological picture on liver biopsy which is recognized as alcoholic fatty liver or hepatic steatosis. In contrast to hepatic steatosis, in acute alcoholic hepatitis there is a true inflammatory process in the liver and it is well recognized that this is a precursor of cirrhosis. Cirrhosis can also develop insidiously without the occurrence of a clinically recognizable episode of alcoholic hepatitis.

MATERIALS & METHODS

The present study was carried out on 250 patients suffering from alcoholic liver diseases in the OPD at Biran Devi Modi Zanana Hospital, Hapur during last 3 years. Remarkable conclusion were drawn on the basis of dietary intake, serum lipid profile, liver function tests, gamma transferase and prothrombin time elaboration.

Fifty normal healthy controls in the age group below 30 to above 50 years were taken. Blood samples were collected to carry out estimations before the treatment was initiated after 15 days, 1 month, 6 months, 12 months, 18 months and 24 months of treatment.

Age

- i. The maximum number of cases included in the study were in third to fifth decade of life,
- ii. It was observed that incidence of alcoholic liver disease was maximum and sustained a high level during adulthood.

Sex

Only males were included in this study as in India there is male preponderance in consumption of alcohol.

OBSERVATIONS & RESULTS

Age

- i. Maximum number of cases were observed in third to fifth decade of life
- ii. It was observed that incidence of ALD attained its peak growth during adulthood. The decline was observed only in fatty liver type of cases at the later part of life.

Sex

Only males were included in the study.

Diet

From this study it appears that fatty liver had higher intake of protein than alcoholic hepatitis and alcoholic cirrhotics, but no difference in alcohol calories in all the three groups was noticed. It infers that high intake of alcohol reduces further the available nutrients because the alcoholics derive the large amount of calories from the alcohol.

Lipid profile

- i. Serum cholesterol was found to be raised in fatty liver and alcoholic hepatitis which came to normal after treatment, whereas in alcoholic cirrhosis it was found low and the patient did not show the normal results even after treatment for two years.
- ii. Patients suffering from alcoholic liver diseases had low levels of HDLc and LDLc. Patients could not show significant change after treatment except for fatty liver.
- iii. Elevated levels of VLDLc were observed in all the three types of alcoholic liver diseases. It did not come up to normal range after treatment in alcoholic cirrhosis.

- iv. Level of triglyceride were raised in fatty liver whereas the levels were much low in alcoholic hepatitis and alcoholic cirrhosis. Patients suffering from fatty liver returned to normal state after treatment.

It is well recognized from the present study that large amounts of alcohol intake has adverse effects not only on the liver but on all tissues of the body including the cardiovascular system, and it is generally agreed that such high intake are not associated with protection against coronary heart disease (Devenji et.al 1980).

LIVER FUNCTION TESTS

- i. The levels of Bilirubin, SGPT, SGOT and alkaline phosphatase were significantly elevated ($P < 0.001$) in all the three types of alcoholic liver disease. Patients suffering from fatty liver turned up to the normal range after the treatment, whereas these levels were still elevated even after 2 years of treatment in alcoholic hepatitis and alcoholic cirrhosis.
- ii. The levels of total protein and albumin were much low as compared to controls in all three types of disease whereas the levels of globulin were elevated after the treatment. Patients suffering from alcoholic hepatitis and alcoholic cirrhosis did not show the normal results.
- iii. Patients suffering from fatty liver, alcoholic hepatitis and alcoholic cirrhosis had elevated levels of r-glutamyl transferase and these values declined after treatment indicating that the levels of this enzyme returns to normal after varying periods of abstinence. It may be useful in monitoring excessive drinking or a return to heavy drinking by alcoholic. This enzyme has potential importance as a diagnostic tool.
- iv. Patients suffering from alcoholic liver diseases had increased levels of prothrombin time. It turned to normal after the treatment but not in the cases of alcoholic cirrhosis which indicates that patients of alcoholic cirrhosis has very poor prognosis.

CONCLUSION

In this study the liver function tests may help in assessing the prognosis and therapeutic response of individual patients. It may provide a valuable tool in evaluation of clinical laboratory effects of treatments.

It is well recognized from the present study that large amounts of alcohol intake has adverse effects

not only on the liver but on all tissues of the body including the cardiovascular system, and it is generally agreed that such high intake are not associated with protection against coronary heart disease (Devenji et. Al. 1980).

The present study is a contribution towards the stride of biochemical research that will help physicians to conquer the disease.

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