

Original research article

Study of Liver function Tests in Alcoholic and Non alcoholic Individuals

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Abstract

Alcoholism represents one of the most serious worldwide socio economic health problems. It is one of the leading cause of preventable mortality, second only to cigarette smoking. Multiple organs can be involved like Hepatobiliary system, cardiovascular system, Central nervous system, Haematopoietic system. Alcohol consumption has been steadily increasing all over world, especially in India. Alcohol can cause physical, mental and social effects which is determined by quantity and pattern of alcohol drinking. Present study was conducted to observe alterations in the liver function parameters in alcohol consumers. Twenty-five adult patients who are moderate alcoholics, 25 patients who are severe alcoholics, and 25 adult patients who are non-alcoholics were selected. Following Liver function test parameters, information of all subjects under the study was collected, Total Bilirubin , Direct bilirubin, Total Protein, Albumin, SGOT, SGPT, ALP. These parameters were compared between alcoholic and non-alcoholic subjects. Total bilirubin , SGOT,SGPT,ALP were increased in Alcoholics as compared to non alcoholics and it was statistically highly significant. There was fall in concentration of the total protein and albumin level in the alcoholics. Liver function test parameters are essential to assess and understand the effect of alcohol on the liver in alcoholics.

Keywords: Alcoholics, Non Alcoholics , liver function tests

Introduction

Alcohol consumption is one of the leading causes of death.[1] It contributes to 3.5% of the global burden of disease and is causally related to more than 60 different medical conditions.[2] A large epidemiological study observed a significant rise in health-related problems among alcohol users in India.[3] Alcohol is not often thought as a drug largely because its use is common for both religious and social purposes in most parts of world. However , it is a drug and of all the drugs , alcohol is the only drug whose self induced intoxication is socially acceptable. Compulsive drinking in excess has become modern society's one of the most serious problems [4] . Alcohol has been widely consumed through ages because of its perceived benefits as a social lubricant and for relaxation , mood alteration and sensory pleasure . But

long term consumption of large amount is harmful leading to addiction and fatal or non fatal injuries . Alcoholism is a worldwide social and medical problem . Over the past 30-40 years , alcohol consumption has increased in quantity and frequency [5] . The age at which people start drinking has also declined. Consumption of alcohol in young people has created concern as alcoholism may run a greater risk of alcoholic problems in later life [6] .All organs can be damaged due to direct effects of alcohol, especially the digestive and nervous systems .At the level of digestive system , alcohol causes gastrointestinal problems , cirrhosis of liver , pancreatitis and cancer of mouth , pharynx and oesophagus . At level of nervous system it causes problems with reflexes , vision , equilibrium of the body , lesions of nerves [7]Regular excessive alcohol consumption may affect Liver functions. The liver is our body's most important organ after the heart.[8] Stress, poor diet, alcohol abuse and overmedication are common problems in our modern lifestyle. Alcohol use disorders affect millions of individuals worldwide. Liver is known as an organ that is primarily affected by alcohol. Alcoholic Liver disease is the cause of an increased morbidity and mortality and accounts for elevated social and economic costs.[9] Alcoholic liver disease (ALD) may take the form of acute involvement (alcoholic hepatitis) or chronic liver disease (steatosis, steatohepatitis, fibrosis and cirrhosis).[10] Objective of this study was to correlate alcohol intake and its effect on liver function test. (LFTs)

Material and Methods :

A retrospective medical chart review was conducted for patients who sought treatment for alcohol use problems for a period of 1 year and healthy non-alcoholic subjects who visited laboratory for routine investigations. A detail history was taken in alcoholics about quantity, type of alcohol, and number of years of alcohol consumed. Name, age, gender, occupation, and socioeconomic status were noted. General and systemic examination was done. The study was approved by the Institutional Ethics Committee.

A. Samples Size:

- 25 adult patients who are moderate alcoholics
- 25 patients who are severe alcoholics and
- 25 adults patients who are non alcoholics

B. Inclusion Criteria:

- All adult patients who are moderate alcoholics that is who consume alcohol less than 80 to 90 mg alcohol which is about 11 drinks per day.
- All adult patients who are severe alcoholics that is who consume more than 80 to 90 mg alcohol or more than 11 drinks per day.
- 25 adults patients who are non alcoholics taken as control.

C. Exclusion Criteria

- All patients who are less than 18 years
- Patients with other hepatic disorders
- Patients receiving hepato- toxic drugs

Collection and Analysis of Blood Samples:

5ml of Blood samples was collected by venipuncture by aseptic technique. The serum was separated from the samples after centrifugation of samples at 3000 RPM. Samples were analyzed for following biochemical parameters on semi automated analyzer.

Following Liver function test parameters, information of all subjects under the study was collected:

Total Bilirubin , Direct bilirubin, Total Protein, Albumin, SGOT, SGPT, ALP.

These parameters were compared between alcoholic and non-alcoholic subjects. All data were entered and analyzed using SPSS. Mean and standard deviation were derived for all parametric variables. Chi-square tests were applied for comparing discrete variables and ANOVA was applied for comparing continuous variables .

Statistical Analysis : Analysis of parameters data of the study subjects and controls was done by using student t test .

p value was calculated , $p < 0.05$ was considered significant and $p < 0.01$ was considered highly significant , $p > 0.05$ was considered not significant .

Results :

Table 1 : Liver function parameters in Alcoholics and Non Alcoholics

LFT parameters	Alcoholics n=50	Non Alcoholics n =25	Significance
Total Bilirubin mg%	5.03±3.45	1.06 ± 0.24	P< 0.01
Direct bilirubin mg%	2.84±1.34	0.78±0.24	P<0.05
Total Protein gm/ l	4.82±0.81	5.62±0.66	P>0.05
Albumin gm/l	2.02±0.42	2.48±0.52	P<0.05
SGOT u/l	93.42±8.17	48.68±5.32	P<0.01
SGPT u/l	79.45±10.54	41.98±3.25	P<0.01
ALP u/l	145.36±60.08	70±15.48	P<0.01

Following Liver function test parameters, Total Bilirubin , Direct bilirubin, Total Protein, Albumin, SGOT, SGPT, ALP were studied . These parameters were compared between alcoholic and non-alcoholic subjects. Total bilirubin , SGOT,SGPT,ALP were increased in Alcoholics as compared to non alcoholics and it was statistically highly significant. There was fall in concentration of the total protein and albumin level in the alcoholics.

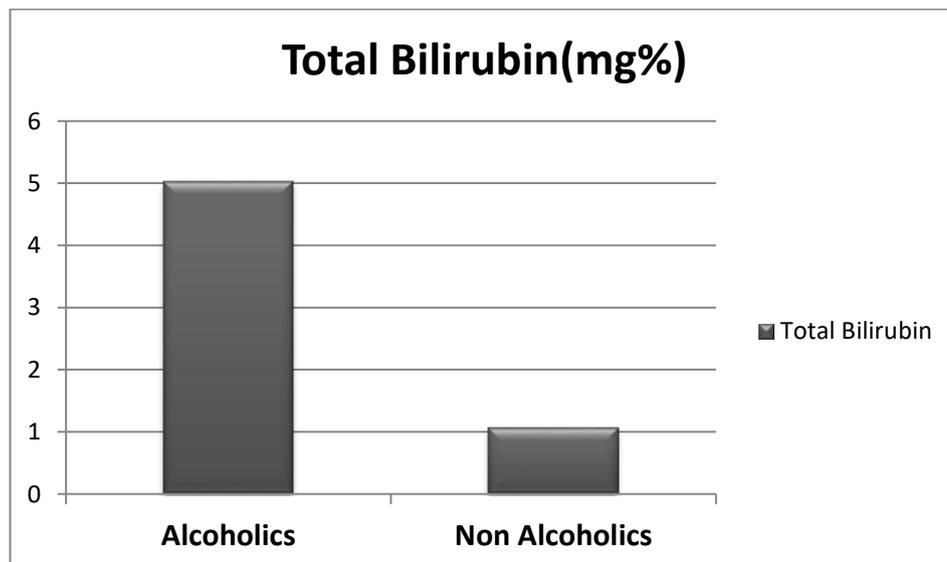


Figure 1 :Total Bilirubin in Alcoholics and Non Alcoholics

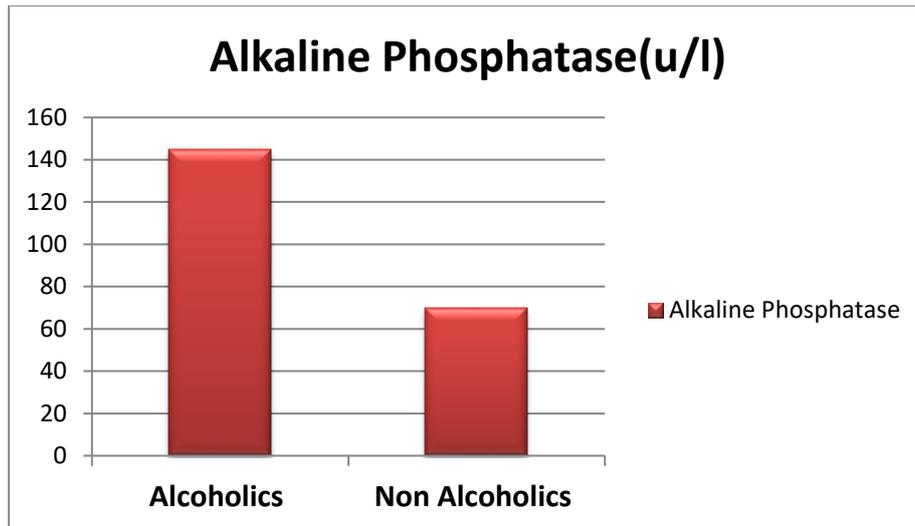


Figure 2 : Alkaline Phosphatase Enzyme in Alcoholics and Non Alcoholics

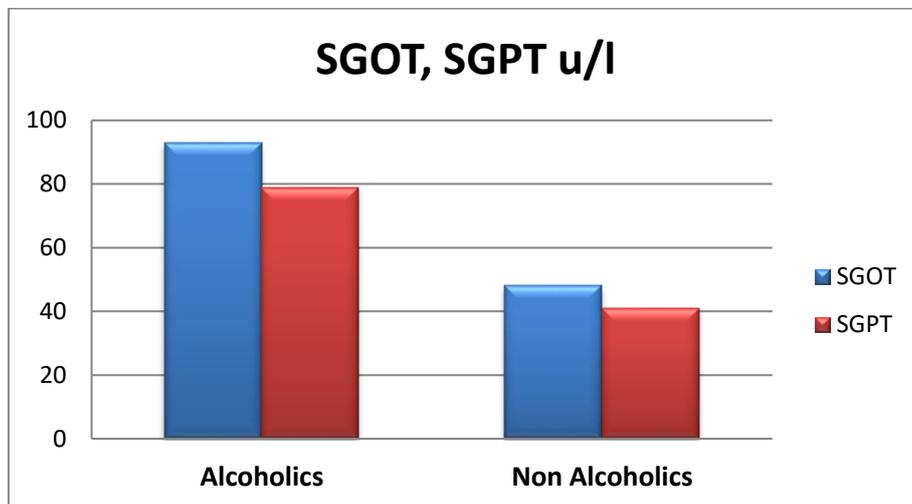


Figure 3 : SGOT, SGPT Enzymes in Alcoholics and Non Alcoholics

Discussion

Liver disease is an insidious process in which the clinical detection may occur weeks, months or many years after the onset of injury. Early clinical detection can be done only by abnormal laboratory tests. Liver is vulnerable to wide variety of metabolic, toxic, microbial and neoplastic insults of which metabolic and toxic insults were taken into consideration in this study because these are more commonly found in a given area.[11] Alcohol, one of the important products of global addiction. Having alcohol is the most proverbial cause of liver disease in community. The risk is more when about 80 gm alcohol (200 ml whiskey or equivalent) consumed per day .Estimation of Serum enzymes is the most effective and economic way to assess the liver disease. Alcohol and related toxicity is commonly affects liver leading to alcoholic liver disease. Alcoholic liver disease is one of the commonest causes of alcohol-related death. Previous studies showed that there occurs alteration in the biochemical parameter in alcoholics that includes the liver enzyme of SGOT, SGPT and alkaline phosphatase as compared to healthily individuals .[12] Present study in population of India showed that the level of total protein, albumin, SGOT,SGPT, ALP are significantly altered in the alcoholics as compared to the normal individuals. The result of this study was in congruence with the results of the previous studies.

Increase in Serum SGOT, SGPT in alcoholic liver disease is supposed to be due the mitochondrial injury in the liver occurring due to alcohol ingestion. Alcohol induced damage to the liver also leads to alteration in the protein synthesis as liver being the important site for protein synthesis. According to study conducted by Usharani et al (2012) Albumin being solely formed in the liver it's concentration is markedly affected by the liver damage in alcoholics. Present study also showed similar results when the total protein and albumin was estimated.[13]

There are many studies showing that alcohol causes deleterious effect on the liver function and which results into change in the biochemical enzymatic alteration. Very few similar studies were conducted in Indian population. The present study is an attempt to retrieve data of liver functions in the alcoholics staying in the India.

Conclusion

The present study clearly establishes that alcohol has direct effect on the physiological functioning of the liver which is proved by alteration in liver function tests. It is also noted that the amount and duration of alcohol consumption is directly related to alcoholic liver diseases. Liver function test parameters are essential to assess and understand the effect of alcohol on the liver in alcoholics. This study concludes that alcoholics had high SGOT, SGPT, ALP which indicating the mitochondrial damage in the liver tissue. The study further concludes that there is decrease in the total protein and albumin level in alcoholics indicating the hampered liver function.

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