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Original Research Article

# SPECTRUM OF LIVER INVOLVEMENT IN CHRONIC ALCOHOL ABUSE: A CLINICAL, BIOCHEMICAL, RADIOLOGICAL AND HISTOPATHOLOGICAL STUDY

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ABSTRACT

**Background:** Alcoholic liver disease (ALD) is a major cause of morbidity and mortality, especially in chronic alcohol users. The study aimed to evaluate the clinical, biochemical, ultrasonographic, and histopathological features of ALD in patients admitted to a tertiary care hospital over one year.

**Materials and Methods:** The study included 50 patients with alcoholic liver disease admitted between June 1997 and May 1998. A detailed history and clinical examination were supplemented with laboratory investigations, liver biopsy, ultrasonography, and oesophagogastroduodenoscopy (OGD) when necessary. Blood tests included liver function tests, serum bilirubin, and enzyme levels, while ultrasonography and histopathology were used to confirm the diagnosis of ALD.

**Results:** The highest incidence of ALD was observed in the 31-40 years age group, with a male preponderance. Fatty liver was the most common lesion (38%), followed by cirrhosis (32%). The most frequent symptoms included loss of appetite, abdominal pain, and distension. Physical signs such as pallor and icterus were prevalent, and elevated serum bilirubin, SGOT, and SGPT were noted in the majority of patients. Histopathology confirmed fatty liver and cirrhosis in a significant number of cases, with ultrasonography being less reliable for definitive diagnosis. A considerable proportion of patients experienced complications such as ascites, hepatic encephalopathy, and variceal bleeding.

**Conclusion:** This study highlights the high prevalence of alcoholic liver disease in chronic alcohol users, particularly those with prolonged alcohol consumption. Histopathology remains the gold standard for diagnosis, while clinical and biochemical tests play a crucial role in patient management. Early intervention is essential to prevent complications and improve prognosis.

**Keywords:** Alcoholic Liver Disease, Fatty Liver, Cirrhosis, Histopathology, Ultrasonography

## INTRODUCTION

Alcoholic beverages have been part of human society since its dawn and can even be seen in the Vedas, which refer to Somaras, the drink of the gods, pointing to the spiritual and cultural significance of alcohol [1,2]. Ancient Romans and Greeks also included alcohol in most of their social customs. According to the World Health Organization, chronic alcoholism is when an individual becomes dependent on alcohol to the point of losing considerable psychosocial functioning and relational health, experiencing withdrawal and mental and physical degradation [3,4]. Considering that alcohol is one of the most common and socially accepted substances to cope with stress and depression, its use is prevalent in rapidly changing societies [5,6]. Specifically, it is lower socioeconomic populations that have the most alcohol use when the price of booze is affordable. Over the years, liver disease from alcohol abuse has become one of the leading killers in many Western societies. Doubtless, the U.S. has one of the highest

rates of alcohol abuse, with more than 10 million alcoholics, and an excess of 200,000 alcohol-related deaths each year [7,8]. Alcohol abuse has also been causatively linked to more than 25 – 30% of all hospital admissions. While it is much more challenging to obtain statistics for alcohol abuse problems in India, a large degree of hospital bed occupancy is due to problems associated with alcohol [9]. Alcohol-related problems have been recognized for over two centuries and include alcoholic liver disease and its complications, alcoholic hepatitis, and cirrhosis. The diagnosis is not difficult and involves clinical assessment, laboratory tests, ultrasound, and histopathology. Ultrasonography is a simple and effective method of screening. The disease is amenable to medical treatment and even abstinence. Some cases of alcoholic hepatitis may improve [10,11].

## MATERIALS AND METHODS

The goal of this study was to analyze the 50 cases of Alcohol Liver Disease (ALD) that were admitted to a tertiary care hospital from June 1997 to May 1998 using several different diagnostic tools. Patients suspected of having ALD went through a number of different tests, such as hematological tests, hepatic profiles, ultrasonography, liver biopsy, necropsy, and Oesophagogastroduodenoscopy (EGD), as well as seeking to screen for such concomitant diseases. People were selected for this study if they had a history of having drunk no less than 250ml of alcohol per day on a triple weekly basis, for no less than 2 years. Once admitted to the hospital, a detailed history was taken from the patients as well as their relatives or colleagues, and this was followed by a complete physical examination to identify any hepatic dysfunction and associated conditions. If patients were HBsAg or HIV positive, they were removed from the study so these (and other) variables would not confound the results. Other tests done included hematological tests of hemoglobin, white blood cell count, and differential, as well as some tests for coagulation parameters (bleeding and clotting times). Urine and stool tests were done to assess for liver disease or abnormalities and an HBsAg test was done to ensure those cases with Hepatitis B were excluded. Liver function tests measured total serum bilirubin, alkaline phosphatase, SGOT, SGPT, prothrombin time, serum protein, and other relevant parameters. Each of the patients was subjected to an abdominal ultrasound. All feasible cases underwent liver biopsy using a Trucut needle, completed with necessary precautions of blood cross-matching and administering vitamin K. Patients underwent a rest period of 24 hours post-biopsy, and a monitoring.

## RESULTS

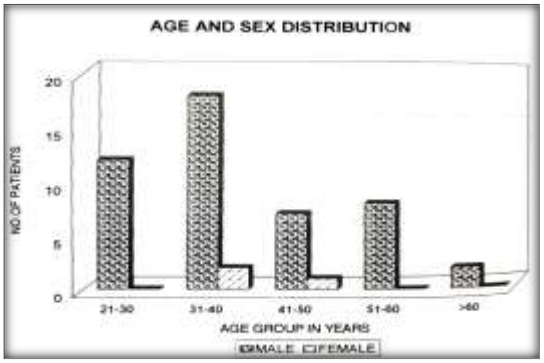



**Figure 1: Age and sex distribution**

**Table 1: Age and sex distribution**

| AGE IN YEARS | MALES | FEMALES | TOTAL |
|---|---|---|---|
| 21-30 | 12 | - | 12 |
| 31-40 | 18 | 2 | 20 |
| 41-50 | 7 | 1 | 8 |
| 51-60 | 8 | 0 | 8 |
| >60 | 2 | 0 | 2 |
| **Total** | **47** | **3** | **50** |

**Table 2: Alcohol equivalent**

| TYPE OF BEVERAGE | QUANTITY (ml) | ETHANOL CONTENT |
|---|---|---|
| Whisky | 300 | 100 gms |
| Wine | 1000 | 100 gms |
| Beer | 2500 | 100 gms |
| Country Liquor | 25 to 55 | Gm / 100 ml |

**Table 3: Duration of alcohol consumption on 50 patients**

| DURATION OF ALCOHOL CONSUMPTION | NO. OF PATIENTS | PERCENTAGE |
|---|---|---|
| 5-10 years | 23 | 46% |
| > 10 years | 27 | 54% |
| **Total** | **50** | **100%** |

**Table 4: Duration of alcoholisms and histopathological stage of alcoholic liver disease**

| DURATION OF ALCOHOLISM | FATTY LIVER | ALCOHOLIC HEPATITIS | LIVER CIRRHOSIS | BIOPSY CONTRAINDICATIONS | TOTAL | % |
|---|---|---|---|---|---|---|
| 5-10 years | 14 | 0 | 3 | 6 | 23 | 46 |
| > 10 years | 5 | 3 | 13 | 6 | 27 | 54 |
| **Total** | **19** | **3** | **16** | **12** | **50** | **100** |

Biopsy was contraindicated in patients with hepatic encephalopathy and in whom prothrombin time was prolonged (did not return to normal even after injection of vitamin K.)

**Patterns of Drinking and Alcoholic Liver Disease (ALD)**

Continuous drinking (≥5 days/week) was associated with a higher incidence of liver disease compared to intermittent drinking (<5 days/week). Among patients with fatty liver, 4 were continuous drinkers, and 15 were intermittent drinkers. For alcoholic hepatitis, 1 patient drank continuously, while 2 drank intermittently. In liver cirrhosis, 15 patients drank continuously, and 1 drank intermittently. Biopsy contraindications also showed higher numbers in continuous drinkers (10) compared to intermittent drinkers (2). This highlights the increased risk of liver disease in those who drink more frequently.

**Symptoms and Frequency by Histopathological Stage**

The most common symptom across all stages was loss of appetite, seen in 82% of patients, followed by pain in the abdomen (46%) and distension of the abdomen (44%). Jaundice and nausea were also frequent, with 38% and 40% of patients, respectively, reporting these symptoms. Vomiting, swelling over the feet, and fever were observed in 36%, 36%, and 34% of patients, respectively. Altered sensorium and hematemesis were less common, affecting 22% and 18% of patients.

**Physical Signs by Histopathological Stage**

Pallor was the most common physical sign (100% of patients), followed by icterus (90%) and hepatomegaly (80%). Ascites was observed in 62% of patients, and pedal oedema in 48%. Hepatic encephalopathy was present in 34% of patients, while fever was seen in 26%. Skin changes, spider nevi, and gynaecomastia were rare, with less than 10% of patients exhibiting these signs.

**Laboratory Findings by Histopathological Stage**

Normocytic normochromic blood was found in 40% of patients, while 36% had hypochromia, and 22% had macrocytosis and hypochromia.

**Liver Function Tests (LFTs) Results**

Serum bilirubin (total) levels were highest in alcoholic hepatitis (mean 10.56), followed by liver cirrhosis (4.1). SGOT levels were elevated in cirrhosis (46.62) and alcoholic hepatitis (32.66), with SGPT levels highest in alcoholic hepatitis (321). Prothrombin time was highest in cirrhosis (32.0) and biopsy contraindicated cases (44.1).

**Deranged LFTs**

84% of patients had raised SGOT levels, and 84% also had hypoalbuminemia. Raised serum bilirubin was found in 78%, while hypoproteinemia was observed in 60%.

**Discriminant Function for Prognosis**

Patients with a discriminant function score >32 had a poorer prognosis, with 12% dying. In contrast, 44% of patients with a score <32 were discharged.

**Endoscopic Findings in Hematemesis**

Of the 9 patients with hematemesis, 5 had gastritis, 2 had oesophageal varices, and 2 had both oesophageal and fundic varices.

**Histopathological Diagnosis**

19 patients were diagnosed with fatty liver, 3 with alcoholic hepatitis, 16 with liver cirrhosis, and 12 had biopsy contraindicated.

**Correlation of Ultrasonography and Histopathology**

34% of patients suspected to have fatty liver on ultrasonography were confirmed by histopathology. Similarly, 32% of patients suspected to have cirrhosis on ultrasonography were confirmed by histopathology.

**Complications of Alcoholic Liver Disease**

Of the 31 patients with ascites, 26 improved, and 5 died. Hepatic encephalopathy affected 17 patients, with 10 improving and 7 dying. Variceal bleeding affected 9 patients, with 8 improving and 1 dying. Hepatorenal syndrome, spontaneous bacterial peritonitis, and hepatocellular carcinoma had no occurrences of improvement or death.

## DISCUSSION

Liver disease caused by alcoholism is a major rising issue around the world. One of the most concerning aspects of this issue is the large number of patients suffering from chronic alcohol dependence who are admitted into the hospital [11]. Of all the organs in the body, the liver is the most vulnerable to the damaging effects of alcohol because it has to break down alcohol whenever it is consumed. Liver damage from chronic alcohol use is a progressive issue in which the liver undergoes irreversible changes in the cirrhotic stage of the disease [12]. At this stage, even supportive treatment has little value. Although the situation is dire, patients improve quite a bit when they reach out for help with the condition in the initial stages, like with alcoholic hepatitis. These conditions allow for effective medical interventions to be implemented [13].

**Age and Sex Incidence**

In ages 31-40, the average age was 40.9 during the study. This is younger than the average age range of the Western studies, including Jeremy Green, which was 46. The malnutrition in the location of the study could also be a reason for the liver being damaged from age at a younger rate than 46. This is also in

accordance with the studies of John T. Galambos, whose studies also discovered a median age of 41.

A sex incidence study, for instance, demonstrated a 16:1 male-to-female ratio, which is significantly higher than what Western authors report. For instance, Brunt (1974) and Levi (1978) report a male-to-female ratio of about 2.5:1. This is largely due to India's societal and cultural framing of alcohol use, which is male-dominated. Women, when present, are socially restricted from alcohol and those few who socially drink, avoid medical consultations due to the stigma surrounding alcohol use disorder [14].

As for the type of alcohol and the period of alcohol use, most of the patients in our study reportedly used country liquor. However, the type of alcohol consumed did not relate to the severity of the liver injury. The main factors causing liver injury were the amount of ethanol consumed and the period over which it was consumed. This is consistent with the findings of Sheila Sherlock, which indicate that it is the average daily consumption of ethanol over a period that matters most in determining liver injury, rather than the type of alcohol consumed [15,16].

Our patients showed symptoms of alcoholic liver disease after consuming much lower amounts of alcohol for shorter periods as compared to Western studies. This might be due to the malnutrition effects in our country as a whole as it increases the risk to the liver. The length of alcohol consumption was also a key factor as 27 of the 50 patients in the study had a history of consuming alcohol for over 10 years. Sheila Sherlock's guidelines, which are not as commonly accepted by everyone, say that 80 grams of alcohol consumption in one day may be the safe boundary [17].

**Symptoms and Clinical Characteristics**

Symptoms arising from alcoholic liver disease are diverse and include gastrointestinal disorders such as nausea, vomiting, appetite loss, and abdominal discomfort. Jaundice developed in 38% of patients, which is consistent with other studies. In addition, patients complained of appetite loss, vertigo, and abdominal swelling, and 82%, 40%, and 44% of patients suffered from these symptoms, respectively. This predominance of gastrointestinal symptoms is consistent with our findings and those of Jeremy Green, who also noted a predominance of these symptoms. Alcohol has local irritant effects as well as malabsorption syndromes, and portal hypertension can explain some of these symptoms.

Endocrine complications were also observed in our survey, which included complaints of testicular atrophy and gynecomastia in three patients. Such symptoms are more common in patients with cirrhosis of the liver, as liver insufficiency, in addition to these symptoms, plays a larger role in the dysfunction of the endocrine system and metabolism of the hormones. This strongly attests to the well-known connection among chronic consumption of alcohol, liver disease, and endocrine disorders.

**Signs and Functions of the Liver**

Hepatomegaly was the most common of the many different physical signs, which almost all patients exhibited, supporting the findings of other studies as well. This is typically due to fatty liver, which causes hepatocytes to swell and fill with fat vacuoles. Jaundice was a common sign as well, with 38% of our patients showing this condition. The origin of jaundice in alcoholic liver disease is due to damage to the liver cells that raises the direct bilirubin levels.[18]

Skin changes, mainly spider nevi and palmar erythema, were less frequent in our study in comparison to the Western population. Spider nevi were noted in 6% of patients and are usually associated with cirrhosis as well as oestrogen excess. In our study, palmar erythema was not common, which potentially is due to the majority of our patients having darker skin, which would make the changes less obvious [19].

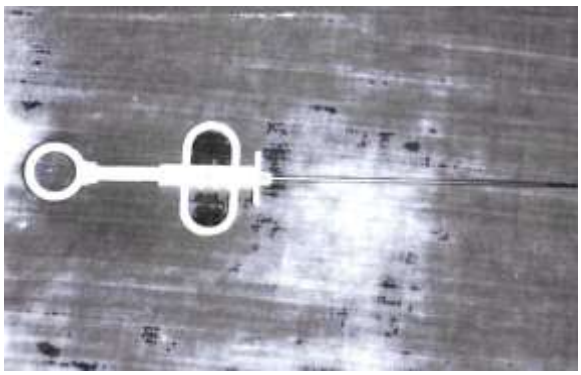
**Complications and Prognosis**

Most of the complications seen in our study, such as ascites, hepatic encephalopathy, and variceal bleeding, were more severe in nature. Ascites was the most prevalent of such complications, as it was seen in 62% of patients. It was most common in patients who had cirrhosis and was typically due to a combination of decreased plasma osmotic pressure with portal hypertension. For 34% of patients with hepatic encephalopathy, this condition was the result of severe liver dysfunction, as the liver could not eliminate the toxic, ammonia-like substances it accumulated [20].

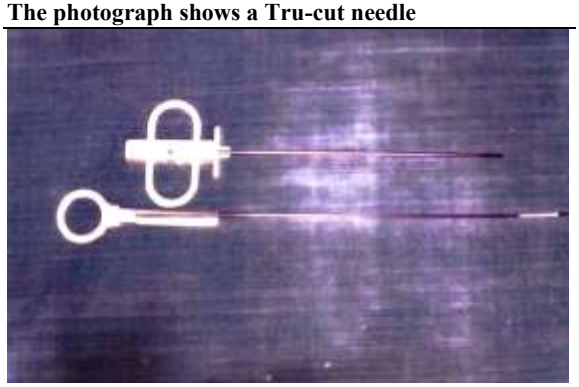
Portal hypertensive gastropathy, which has the potential to cause gastrointestinal bleeding, was present in 18% of patients. This coincides with the reports presented by Tadashi Iwao et al. (1992), who traced portal hypertensive gastropathy to be a major complication of cirrhosis. However, spontaneous bacterial peritonitis and hepatocellular carcinoma were absent in this study, primarily due to the absence of long-term follow-up [21-24].

**Diagnostic Techniques and Histopathology**

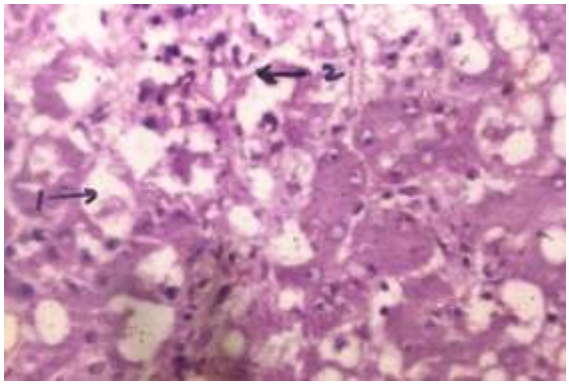
Lastly, tissue pathology report was important to find and determine the severity of liver injury. In this study, liver biopsies were performed on 32 patients, of which 19 had liver steatosis, 3 had alcoholic hepatitis, and 16 had alcoholic cirrhosis. These findings were in line with what has been previously published in the literature, which documents the high severity of liver injury in patients with frequent bouts of alcoholism. Of all the cases, liver ultrasound, although not as specific as liver biopsy, was able to detect liver abnormalities in 95% of patients and hence, can be safely considered to be a good screening test [25,26].



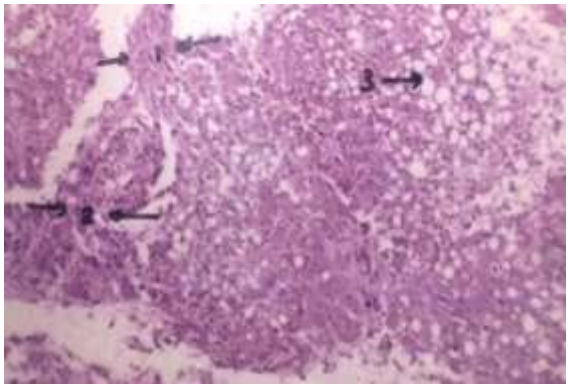
**The photograph shows a Tru-cut needle**



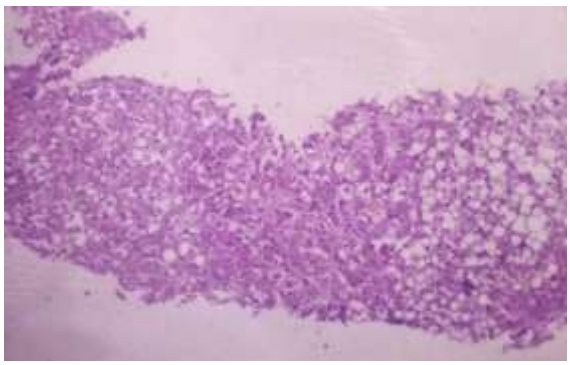
**Photograph shows Tru-cut needle with trocar**



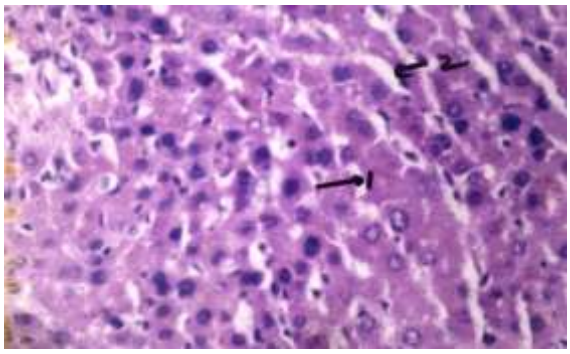

**Microphotograph (H.P. View)**
**Extensive fatty change**
**Inflammatory infiltrates**



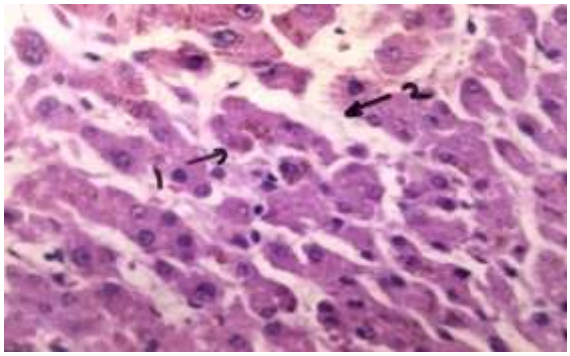

**Microphotograph (L.P.View)**
**Fragmented liver biopsy showing (1) fibrosis, (2) pseudolobule formation (3) fatty change.**



**TMicrophotograph (Scanner View)**
**Extensive fatty change:**
**Inflammatory infiltrates**




**Microphotograph (L.P. View)**
**Hepatocytes showing (1) Cholestasis (2) Dilated sinusoids.**




**Microphotograph (H.P. View)**
**Hepatocytes showing (1) Cholestasis, (2) Dilated sinusoids.**

## CONCLUSION

In conclusion, this study of fifty alcoholic patients has provided valuable insights into the prevalence and characteristics of alcoholic liver disease. The majority of cases were observed in males within the 31-40 age group, with the duration of alcoholism varying between 5 to 10 years for 46% of patients and more than 10 years for 54%. Fatty liver was the most common lesion, seen in 38% of patients, while alcoholic hepatitis was the least common at 6%. The clinical manifestations primarily included loss of appetite, abdominal pain, and distension, with pallor, icterus, hepatomegaly, and ascites being the most frequent physical signs. Biochemical findings revealed elevated liver enzymes such as SGOT and

SGPT in most patients, while histopathological and ultrasonographic examinations helped in confirming the diagnosis of fatty liver and cirrhosis. Additionally, complications such as ascites, hepatic encephalopathy, and variceal bleeding were prevalent in a significant proportion of patients. The study highlights the importance of liver biopsy and histopathological examination for definitive diagnosis, particularly in cases where ultrasonography shows discrepancies. The findings underscore the severity of alcoholic liver disease and the need for early diagnosis and intervention to manage the disease effectively.

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