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CLINICAL PROFILE AND OUTCOMES OF ALCOHOLIC LIVER DISEASE: IMPACT OF ALCOHOL CONSUMPTION PATTERNS AND COMORBID CONDITIONS.

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Conflicts of Interest: Nil

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ABSTRACT

Objective: To investigate the prevalence, clinical manifestations, and outcomes of alcoholic liver disease (ALD) and to assess the impact of alcohol consumption patterns and associated comorbid conditions on disease progression.

Methods: This cross-sectional study was conducted at a tertiary care hospital from January 2023 to December 2023. The study included 150 patients with a history of excessive alcohol consumption. Data were collected on demographics, alcohol consumption patterns, presence of comorbidities, and clinical outcomes. Biochemical markers (AST, ALT, GGT, and bilirubin) and imaging studies (ultrasound, CT, or MRI) were used to assess liver damage. Liver biopsy was performed for patients with suspected cirrhosis.

Results: The study population had a mean age of 54.2 years, predominantly male (63%). The average daily alcohol intake was 60.4 grams, with a mean duration of alcohol use of 12.6 years. The prevalence of different stages of ALD was as follows: 40% had fatty liver, 30% had alcoholic hepatitis, 20% had cirrhosis, and 10% had hepatocellular carcinoma. Significant positive correlations were found between the duration of alcohol use and daily alcohol intake with the severity of ALD ($r = 0.52$, $p < 0.01$ and $r = 0.47$, $p < 0.01$, respectively). Comorbid conditions such as hepatitis C and obesity were associated with more severe stages of ALD. Elevated liver enzymes (AST, ALT, GGT) and bilirubin levels were prevalent, indicating significant liver injury.

Conclusion: ALD is prevalent among individuals with heavy alcohol consumption, with severity correlated to alcohol intake and duration. Comorbidities such as hepatitis C and obesity exacerbate liver damage. Early detection through screening and comprehensive management, including alcohol cessation and treatment of comorbid conditions, is crucial for improving patient outcomes. These findings underscore the need for targeted interventions to address ALD effectively.

Keywords: Alcoholic liver disease, liver dysfunction, alcohol consumption, comorbidities, liver biopsy, clinical outcomes.

INTRODUCTION

Alcoholic liver disease (ALD) is a major global health concern and a leading cause of chronic liver disease, characterized by a spectrum of liver injuries ranging from fatty liver to cirrhosis and hepatocellular carcinoma. ALD results from excessive and prolonged alcohol consumption, which induces liver injury through various pathophysiological mechanisms including oxidative stress, inflammation, and alterations in lipid metabolism (1,2). The clinical presentation of ALD varies widely, reflecting its complex natural history and the interplay of genetic, environmental, and behavioral factors (3).

The initial stage of ALD, alcoholic fatty liver (steatosis), is often asymptomatic and reversible with abstinence from alcohol. However, progression to alcoholic hepatitis, characterized by jaundice, abdominal pain, and systemic

inflammation, marks a more severe form of liver injury and can lead to significant morbidity and mortality (4,5). Chronic alcohol consumption can eventually result in cirrhosis, where fibrosis progresses to extensive scarring of the liver tissue, leading to portal hypertension, liver dysfunction, and increased risk of hepatocellular carcinoma (6,7).

Epidemiological studies have identified several risk factors for ALD, including the quantity and duration of alcohol intake, genetic predispositions, and coexisting conditions such as obesity and hepatitis C infection (8,9). The risk of developing ALD is dose-dependent, with heavy and prolonged drinking significantly increasing the likelihood of progression from steatosis to more severe liver damage (10,11). Gender differences also play a role, as women are more susceptible to alcohol-induced liver damage compared to men, even at lower levels of consumption (12,13).

Diagnosing ALD involves a combination of clinical assessment, laboratory tests, and imaging studies. Serum biomarkers, such as alanine aminotransferase (ALT), aspartate aminotransferase (AST), and gamma-glutamyl transferase (GGT), along with imaging techniques like ultrasound, computed tomography (CT), and magnetic resonance imaging (MRI), are used to evaluate liver injury and monitor disease progression (14,15). Liver biopsy remains the gold standard for assessing the extent of liver damage, though it is not always practical for routine use (16).

Effective management of ALD requires a multifaceted approach, including alcohol cessation, nutritional support, and treatment of associated conditions. Pharmacological therapies, such as corticosteroids for severe alcoholic hepatitis and antifibrotic agents for cirrhosis, are employed based on disease severity (17,18). Abstinence from alcohol is crucial for halting disease progression and improving outcomes (19).

This clinical study aims to analyze the prevalence, clinical features, and outcomes of patients with ALD, focusing on the impact of alcohol consumption patterns, associated risk factors, and therapeutic interventions. By providing a comprehensive overview of ALD, this study seeks to enhance understanding and improve management strategies for this significant liver disease.

Aim

To evaluate the clinical characteristics, prevalence, and outcomes of alcoholic liver disease (ALD) and to assess the impact of alcohol consumption patterns and associated risk factors on disease progression.

Objectives

1. To determine the prevalence and clinical presentation of different stages of alcoholic liver disease, including fatty liver, alcoholic hepatitis, and cirrhosis, among patients with a history of excessive alcohol consumption.
2. To investigate the relationship between alcohol consumption patterns (e.g., quantity, duration) and the severity of liver damage, as well as the impact of comorbid conditions such as obesity and hepatitis C on disease progression. Materials and Methods

This study was conducted at a tertiary care hospital to analyze the clinical characteristics, prevalence, and outcomes of alcoholic liver disease (ALD). The study included a total of 150 patients with a history of excessive alcohol consumption, enrolled between January 2017 and December 2019.

Inclusion Criteria:

1. **History of Excessive Alcohol Consumption:** Patients aged 18 years or older with a documented history of alcohol consumption exceeding 40 grams per day for men and 20 grams per day for women over a period of at least six months.
2. **Clinical Diagnosis of ALD:** Patients diagnosed with ALD, including alcoholic fatty liver, alcoholic hepatitis, or cirrhosis, based on clinical, biochemical, and imaging criteria.
3. **Informed Consent:** Patients who provided written informed consent to participate in the study.

Exclusion Criteria:

1. **Non-Alcoholic Liver Disease:** Patients with liver disease attributable to causes other than alcohol, including viral hepatitis, autoimmune liver disease, or non-alcoholic fatty liver disease.
2. **Recent Alcohol Withdrawal:** Patients who had undergone alcohol withdrawal treatment within the last three months, as recent withdrawal could affect liver function assessments.
3. **Significant Comorbidities:** Patients with severe comorbid conditions, such as advanced renal failure or malignancies, which could confound the assessment of liver disease progression.
4. **Inadequate Data:** Patients with incomplete clinical, biochemical, or imaging data, which could impair the accuracy of disease staging and severity assessment.

Data Collection: Clinical data including demographic information, alcohol consumption patterns, and comorbid conditions were collected. Biochemical markers such as liver enzymes (AST, ALT, GGT), serum bilirubin, and prothrombin time were measured to assess liver function. Imaging studies including abdominal ultrasound, computed tomography (CT), or magnetic resonance imaging (MRI) were performed to evaluate the extent of liver damage. Liver biopsy was conducted for patients with suspected cirrhosis to confirm the diagnosis and assess fibrosis stage.

Statistical Analysis: Descriptive statistics were used to summarize demographic and clinical characteristics. The prevalence of different stages of ALD was calculated. Correlation analyses were conducted to examine the relationship between alcohol consumption patterns, comorbid conditions, and liver disease severity. Comparative analysis was performed using t-tests and chi-square tests, with a p-value of <0.05 considered statistically significant.

Results

Table 1: Baseline Characteristics of Study Population

Characteristic	Value (n = 150)
Mean Age (years)	54.2 ± 9.8
Gender (Male/Female)	95/55
Mean Duration of Alcohol Use (years)	12.6 ± 7.4
Average Daily Alcohol Consumption (g)	60.4 ± 15.6
Prevalence of Hepatitis C (%)	20%
Prevalence of Obesity (%)	35%

The study cohort had a mean age of 54.2 years, predominantly male (63%). The average duration of alcohol use was 12.6 years, with an average daily intake of 60.4 grams. Hepatitis C and obesity were present in 20% and 35% of patients, respectively.

Table 2: Distribution of ALD Stages

Stage of ALD	Number of Patients (n)	Percentage (%)
Fatty Liver (Steatosis)	60	40%
Alcoholic Hepatitis	45	30%
Cirrhosis	30	20%
Hepatocellular Carcinoma	15	10%

Among the 150 patients, 40% were diagnosed with fatty liver, 30% with alcoholic hepatitis, and 20% with cirrhosis. Hepatocellular carcinoma was observed in 10% of the cohort, indicating advanced disease progression.

Table 3: Correlation of Alcohol Consumption and Comorbid Conditions with ALD Severity

Factor	Correlation with ALD Severity	p-value
Duration of Alcohol Use (years)	Positive correlation (r = 0.52)	<0.01
Average Daily Alcohol Consumption (g)	Positive correlation (r = 0.47)	<0.01
Presence of Hepatitis C (%)	Higher prevalence in advanced stages	0.03
Presence of Obesity (%)	Higher prevalence in advanced stages	0.04

Both the duration of alcohol use and average daily alcohol consumption showed significant positive correlations with the severity of ALD (r = 0.52 and r = 0.47, respectively). The presence of hepatitis C and obesity were also associated with more severe stages of ALD, with statistical significance.

Table 4: Biochemical and Imaging Findings

Biochemical Marker	Mean Value	Normal Range	Percentage Abnormal
AST (U/L)	78.4 ± 25.3	10-40	70%
ALT (U/L)	64.7 ± 20.8	7-56	65%
GGT (U/L)	123.5 ± 34.6	9-48	80%
Bilirubin (mg/dL)	2.4 ± 1.1	0.1-1.2	50%

The mean levels of liver enzymes (AST, ALT, and GGT) were elevated in a significant proportion of patients, indicating liver injury. Elevated bilirubin levels were found in 50% of patients, reflecting impaired liver function.

Discussion

This study provides significant insights into the clinical profile of alcoholic liver disease (ALD), highlighting the prevalence, stages, and associations with alcohol consumption and comorbid conditions. Our findings reveal that ALD is prevalent in a substantial proportion of patients with a history of excessive alcohol consumption. Specifically, 40% of patients were diagnosed with fatty liver, 30% with alcoholic hepatitis, 20% with cirrhosis, and 10% with hepatocellular carcinoma.

The association between alcohol consumption patterns and the severity of ALD is well-supported by our data. The positive correlation between the duration of alcohol use and daily alcohol intake with ALD severity aligns with previous research demonstrating that chronic alcohol consumption is a major risk factor for liver injury and progression to more severe forms of ALD (10,20). Higher daily alcohol intake and longer duration of consumption are known to exacerbate liver damage, leading to increased rates of progression from fatty liver to alcoholic hepatitis and cirrhosis (21,22).

Our study also confirms the impact of comorbid conditions such as hepatitis C and obesity on ALD severity. The presence of hepatitis C was associated with a higher prevalence of advanced liver disease, consistent with literature indicating that co-infection with hepatitis C accelerates liver fibrosis and increases the risk of cirrhosis (23,24). Similarly, obesity was linked to more severe ALD, reflecting its role in enhancing liver inflammation and fibrosis through mechanisms like increased oxidative stress and adipokine dysregulation (25,26).

Biochemical markers, including elevated AST, ALT, and GGT levels, and increased bilirubin levels observed in our study, are indicative of liver injury and dysfunction. Elevated liver enzymes are commonly associated with ALD and are useful in assessing the extent of liver damage (27). Elevated bilirubin levels further reflect the compromised liver function, which is consistent with the progression to more severe stages of liver disease (28).

The findings underscore the critical importance of early detection and intervention in managing

ALD. Routine screening for liver function abnormalities and imaging studies in patients with a history of excessive alcohol consumption can facilitate early diagnosis and prevent progression to more severe stages. Abstinence from alcohol remains the cornerstone of treatment, alongside management of comorbid conditions and nutritional support (29,30).

In conclusion, this study reinforces the need for comprehensive management strategies for ALD, considering both alcohol consumption patterns and associated risk factors. Addressing these factors through early intervention and lifestyle modifications can improve patient outcomes and mitigate the progression of liver disease.

Conclusion

This study underscores the high prevalence and diverse clinical manifestations of alcoholic liver disease (ALD) among patients with a history of excessive alcohol consumption. Our findings reveal that ALD ranges from fatty liver and alcoholic hepatitis to more severe conditions such as cirrhosis and hepatocellular carcinoma. The severity of liver disease was positively correlated with the duration and quantity of alcohol consumption, emphasizing the dose-dependent nature of alcohol's hepatotoxic effects.

Significantly, comorbid conditions like hepatitis C and obesity were associated with increased severity of ALD, indicating that these factors exacerbate liver damage and accelerate disease progression. Elevated liver enzymes and bilirubin levels further corroborate the extent of liver injury and dysfunction in the studied cohort.

The results highlight the critical need for early detection and proactive management of ALD. Routine screening for liver dysfunction in individuals with a history of heavy alcohol use, combined with regular monitoring of liver function and imaging, can facilitate early diagnosis and intervention. Abstinence from alcohol, along with management of coexisting conditions and supportive therapies, remains essential for halting disease progression and improving patient outcomes.

In summary, addressing both alcohol consumption patterns and associated comorbidities through comprehensive care strategies is vital for improving the prognosis of patients with ALD. Future research should focus on refining diagnostic and therapeutic approaches to enhance the management of ALD and mitigate its impact on public health.

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