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Assessment of Pharmacological Interventions of Chronic Alcoholic Liver Disease and Their Clinical Outcomes

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Abstract: ***Background and Aim: This study aims to evaluate the effectiveness of pharmacological interventions for chronic ALD, analyze the demographic and clinical profile of ALD patients, assess the associated complications, and investigate the prescription patterns of drugs used in ALD treatment.***
Methods and materials: This prospective observational study was conducted in the outpatient and inpatient units of the Department of Gastroenterology at a tertiary care hospital. The study was carried out over a 6-month period, with a total sample size of 64 subjects.
Results and discussion: The study focuses on 64 subjects with ALD, recommending nutritional support(76.6%), alcohol abstinence(95.3%), ursodeoxycholic acid(60.9%), antibiotics(42.2%), and benzodiazepines(25%) for management and prognosis. Liver transplant is the only viable treatment, with hepatologists and addiction specialists providing integrated therapy.
Out of 16 alcoholic hepatitis patients, 56.3% improved, 43.8% had persistent conditions, and 83.3% improved in compensated disease state.
Conclusion: The study found that alcohol abstinence, along with nutritional and pharmacological therapy, improves quality of life in compensated ALD. Liver transplantation is an option for advanced cases. Psychological and pharmacological support aid in abstinence, though alcohol withdrawal can cause behavioral, gastrointestinal, and neurological issues.
Keywords: Alcohol Liver Disease (ALD), alcohol abstinence, fatty liver, alcoholic hepatitis, cirrhosis

I. INTRODUCTION

Excessive alcohol intake can lead to Alcohol Liver Disease (ALD), a common chronic liver disease. Factors like inflammation, diet, and genetics influence its severity and progression.

Excessive alcohol consumption is the primary cause of Alcohol-Related Liver Disease (ALD). Prolonged heavy drinking can lead to fatty liver disease and alcoholic hepatitis, while long-term excessive drinking can result in alcoholic hepatitis and cirrhosis. Individuals who regularly consume alcohol above recommended limits are at a higher risk of developing ALD. Other factors contributing to the risk include obesity, gender (women are more susceptible), age, ethnicity, genetics, diet, drug use, smoking, and viral infections. While not all problem drinkers develop severe liver disease, factors like drinking patterns, gender, and genetic predisposition can influence the progression of the disease.

Recent trends indicate a significant increase in alcohol use disorders and high-risk drinking behaviors, particularly among vulnerable populations. Over the past decade, there has been a notable 30% rise in alcohol use disorders and a 50% increase in high-risk drinking, primarily affecting younger women, older individuals, racial and ethnic minorities, and lower-income communities. This alarming surge in alcohol consumption has directly contributed to a 40% increase in mortality rates associated with alcohol-related liver diseases.

ALD can cause fatty liver, alcoholic hepatitis, and cirrhosis. Excessive alcohol consumption can lead to a spectrum of liver diseases, collectively known as Alcoholic Liver Disease (ALD). This progressive condition encompasses various stages, from mild fatty liver to severe conditions like alcoholic hepatitis and cirrhosis.

1) Alcoholic fatty liver :It is characterized by excessive fat accumulation in the liver, can progress to more severe forms if alcohol consumption persists.

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2) Alcoholic hepatitis : A more advanced stage, involves inflammation of the liver and can lead to significant liver damage, including liver failure.

3) Cirrhosis :The most severe stage of ALD, is characterized by irreversible scarring of the liver tissue.

This advanced stage can lead to serious complications, including liver failure, portal hypertension, and hepatocellular carcinoma. Abstinence from alcohol is crucial for mitigating the progression of ALD and improving overall prognosis.

Early signs of alcoholic liver disease may be subtle, often mistaken for other issues like stomach problems. **Symptoms** can include abdominal pain, nausea, vomiting, loss of appetite, and fatigue. As the disease progresses, more severe symptoms may appear, such as jaundice, swelling in the abdomen, and confusion. It's important to recognize these signs and seek medical attention, especially if alcohol consumption continues. Early diagnosis and treatment can help prevent further liver damage and complications.

Fatty liver disease can be characterized by abdominal pain, nausea, vomiting, diarrhea, and decreased appetite. Alcoholic fatty liver disease, often referred to as a silent illness, can cause liver growth without showing symptoms.

Acute alcohol hepatitis (AH) can be subdivided into four broad headings: specific to existing AH, underlying cirrhosis, associated diseases, and signs of alcohol withdrawal.

Cirrhosis symptoms include weariness, queasy stomach, diminished hunger, weight, and red blood vessels.

Late-stage signs include swelling, ascites, fever, skin itching, decreased appetite, weakness, and heightened alcohol sensitivity.

Diagnosing ALD can be complex due to its varying symptoms. Doctors often use screening tools like AUDIT and AUDIT-C to assess alcohol consumption. Physical examinations help identify signs like jaundice or swelling. Blood tests and imaging tests, such as ultrasounds and CT scans, provide valuable information about liver health. While a liver biopsy is the most definitive test, it's not always necessary and carries potential risks. Combining these diagnostic methods helps healthcare providers accurately diagnose ALD and develop appropriate treatment plans.

ALD can lead to serious **complications** like portal hypertension, ascites, hepatic encephalopathy, and liver cancer. Additionally, abrupt alcohol cessation can trigger severe withdrawal symptoms, including tremors, anxiety, insomnia, nausea, and seizures. Early diagnosis and treatment of ALD are crucial to prevent these complications and improve patient outcomes.

The primary treatment for ALD is full abstinence from alcohol. This, paired with a well-balanced diet high in protein, vital vitamins, and minerals, can assist improve liver function and general health. Additionally, nutritional therapy helps address malnutrition, which is a major problem in ALD patients. While medical measures and psychological support may be required in severe cases, long-term abstinence remains the basis of effective recovery.

Pharmacological interventions for ALD are multifaceted and often tailored to specific patient needs. Benzodiazepines, such as lorazepam, chlordiazepoxide and oxazepam are commonly used to manage alcohol withdrawal symptoms. Antibiotics like rifaximin, ofloxacin and ceftriaxone/sulbactum can help reduce bacterial overgrowth in the gut. Antioxidants like NAC and SAMe may offer protective effects against liver damage. Corticosteroids, such as prednisolone, are used to treat severe alcoholic hepatitis. Albumin infusions can help manage fluid imbalances and kidney function. Analgesics like tramadol can provide pain relief.

Liver transplantation is a potential treatment for severe ALD, but it's not a cure-all. Patients must maintain long-term abstinence from alcohol to improve outcomes and reduce risks of complications. Psychotherapy, such as Cognitive-behavioral therapy (CBT) and Motivational Enhancement Treatment (MET), can help patients develop coping mechanisms and avoid relapse. Inpatient rehabilitation programs provide structured support and therapy to aid in recovery.

II. MATERIALS AND METHODS

The study is a prospective observational study lasting six months, with follow-ups scheduled for 2-3 months.

A. Participants:

A total of 64 adult patients were enrolled in this study. Participants included both diabetic and non-diabetic individuals diagnosed with Alcoholic Liver Disease (ALD), encompassing a spectrum from recent-onset to chronic cases. The study population comprised both male and female patients. Informed consent was obtained from all eligible participants. Patients who declined participation, pregnant or lactating women, and individuals who had undergone liver transplantation were excluded from the study.

B. Statistical methods:

All subsequent tests utilized patient categorization based upon the standardized questionnaire.Demographicfactors[gender, age] were assessed and compared for the different groups of patients utilizing pearson chi-square tests and descriptive measures were calculated, including frequencies, percentages, means and standard deviations.

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To fulfill the study's objective, researchers applied a component bar diagram and pie charts for the data analysis.All statistical tests were two sided, the P values less than 0.05 were considered significant.

III. RESULTS

Frequency distribution of diagnosis: According to figure-1 and table-1 out of 64 subjects with ALD;
16(25%) are diagnosed with Alcoholic hepatitis, 32(50%) are diagnosed with cirrhosis and 16(25%) are diagnosed with Fatty liver.
Table : 1

Diagnosis	Frequency	Percentage
Alcoholic hepatitis	16	25
Cirrhosis	32	50
Fatty liver	16	25
Total	64	100

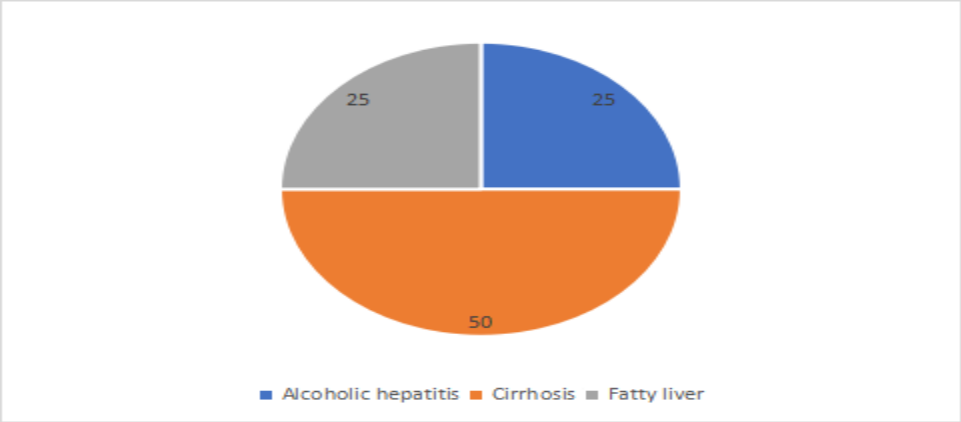


Figure-1: Subjects distribution based on diagnosis

A. Frequency distribution of social habits:

According to figure-8 and table-3 out of 64 subjects with ALD;
58(90.6%) have the habit of alcohol consumption and 6(9.4%) have the both (alcohol and smoking) habits.
Table-2:

Habits	Frequency	Percentage
Alcohol consumption	58	90.6
Both	6	9.4
Total	64	100

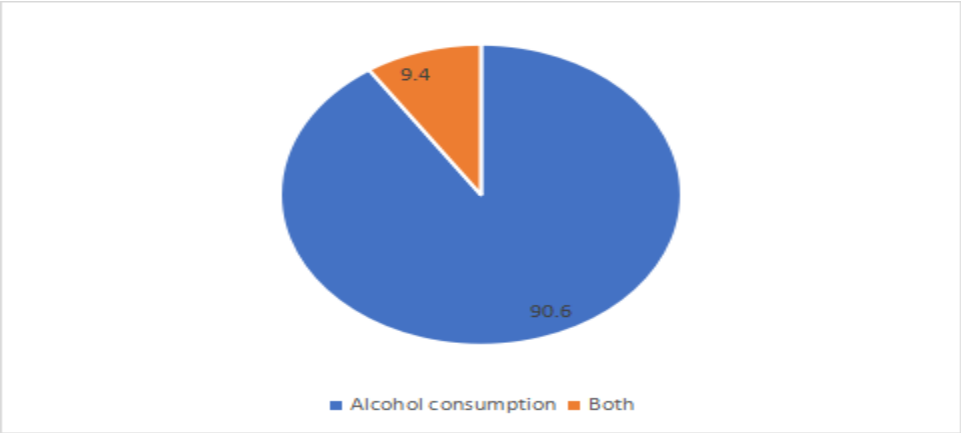


Figure-2: Subjects distribution based on their social habits.

B. Frequency distribution of treatment:

According to table-3 and figure-3

In 64 subjects with ALD; 61 (95.3%) were advised to abstain from alcohol In 64 subjects with ALD; 49 (76.6%) were given nutritional supplements In 64 subjects with ALD; 39 (60.9%) were given ursodeoxycholic acid medications In 64 subjects with ALD; 27 (42.2%) were given antibiotics In 64 subjects with ALD; 6 (9.4%) were given alcohol withdrawing drugs In 64 subjects with ALD; 9 (14.1%) were given antioxidants In 64 subjects with ALD; 16 (25%) were given benzodiazepines In 64 subjects with ALD; 7 (10.9%) were given analgesics In 64 subjects with ALD; 3 (4.7%) were given albumin

Table-3

Treatment	Frequency (n=64)	Percentage
Alcohol abstinence	61	95.3
Nutritional supplements	49	76.6
Ursodeoxycholic acid	39	60.9
Antibiotics	27	42.2
Alcohol withdrawal drugs	6	9.4
Antioxidants	9	14.1
Benzodiazepines	16	25
Analgesics	7	10.9
Albumin	3	4.7

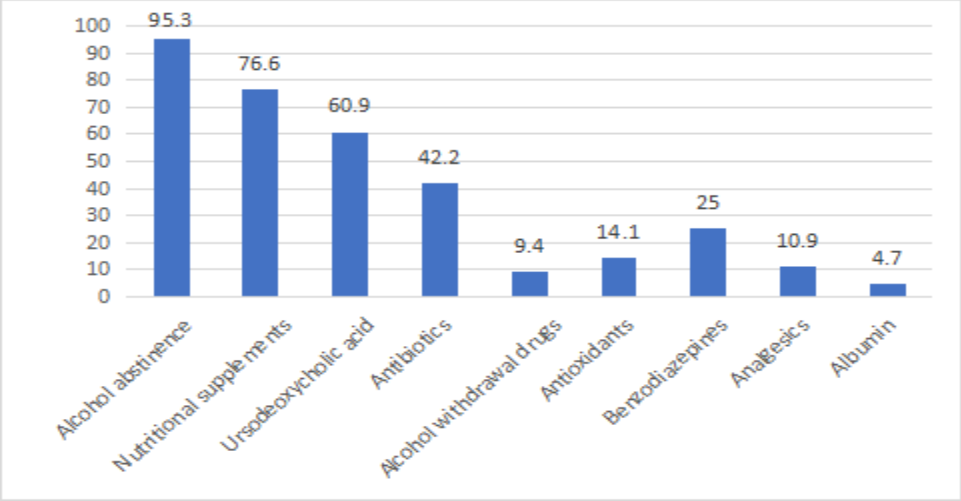


Figure-3: subjects distribution based on the treatment

C. Frequency distribution of alcohol abstinence vs condition of the patient:

According to table-4 and figure-4 Out of 53 subjects abstaining from alcohol; 32(60.4%) had an improved condition and 21(39.6%) had a persistent condition Out of 11 subjects consuming alcohol; 2(18.2%) had an improved condition and 9(81.8%) had a persistent condition.

Table- 4

Alcohol abstinence	Condition of patient		Total No. (%)	Mc Nemer test (P value)
	Improved No. (%)	Persistent No. (%)		
Yes	32 (60.4)	21 (39.6)	53	0.011
No	2 (18.2)	9 (81.8)	11	
Total	34 (53.1)	30 (46.9)	64	

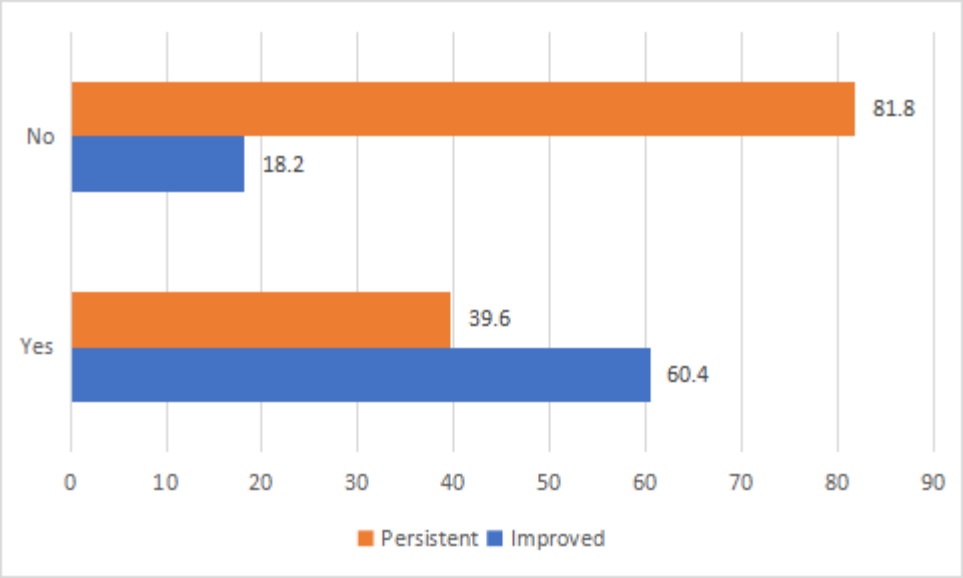


Figure-4: subjects distributed based on alcohol abstinence vs condition of patient:

D. Frequency distribution on disease state vs condition of patient:

According to table-5 and figure-5; Out of 30 subjects having compensated disease state; 25(83.3%) had an improved condition and 5(16.7%) had a persistent condition. Out of 34 subjects having decompensated disease state; 9(26.5%) had an improved condition and 25(73.5%) had a persistent condition.

Table- 5:

Disease state	Condition of patient		Total No. (%)	Mc Nemer test (P value)
	Improved No. (%)	Persistent No. (%)		
Compensated	25 (83.3)	5 (16.7)	30	<0.001
Decompensate	9 (26.5)	25 (73.5)	34	
Total	34 (53.1)	30 (46.9)	64	

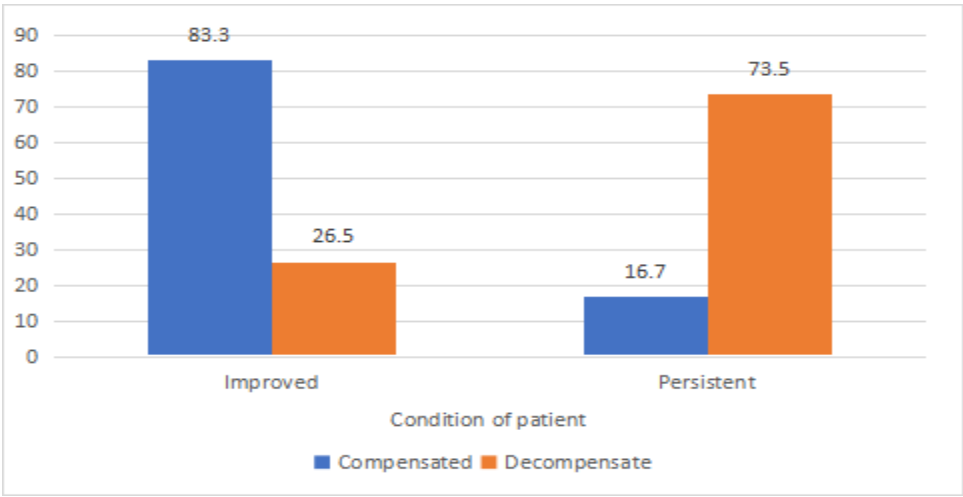


Figure-5: Subjects distribution based on disease state vs condition of patient.

IV. DISCUSSION

Our study objective was to examine the screening tools used for AUD, prescription pattern and complications due to alcohol withdrawal. This study examined 64 individuals with Alcohol Liver Disease (ALD). Among them, 25% had alcoholic hepatitis, 50% had cirrhosis, and 25% had fatty liver. A substantial majority (90.6%) were alcohol consumers, while 9.4% consumed both alcohol and tobacco. The study participants received various treatments, including alcohol cessation advice (95.3%), nutritional supplements (76.6%), ursodeoxycholic acid (60.9%), antibiotics (42.2%), alcohol withdrawal medications (9.4%), antioxidants (14.1%), benzodiazepines (25%), analgesics (10.9%), and albumin (4.7%).

Among those who abstained from alcohol, 47.2% had compensated liver disease, while 52.8% had decompensated disease. In contrast, among those who continued drinking, 45.5% had compensated disease, and 54.5% had decompensated disease.

Following a follow-up period, 83.3% of individuals with compensated liver disease showed improvement, while 16.7% had persistent disease. In the decompensated group, 26.5% improved, and 73.5% had persistent disease.

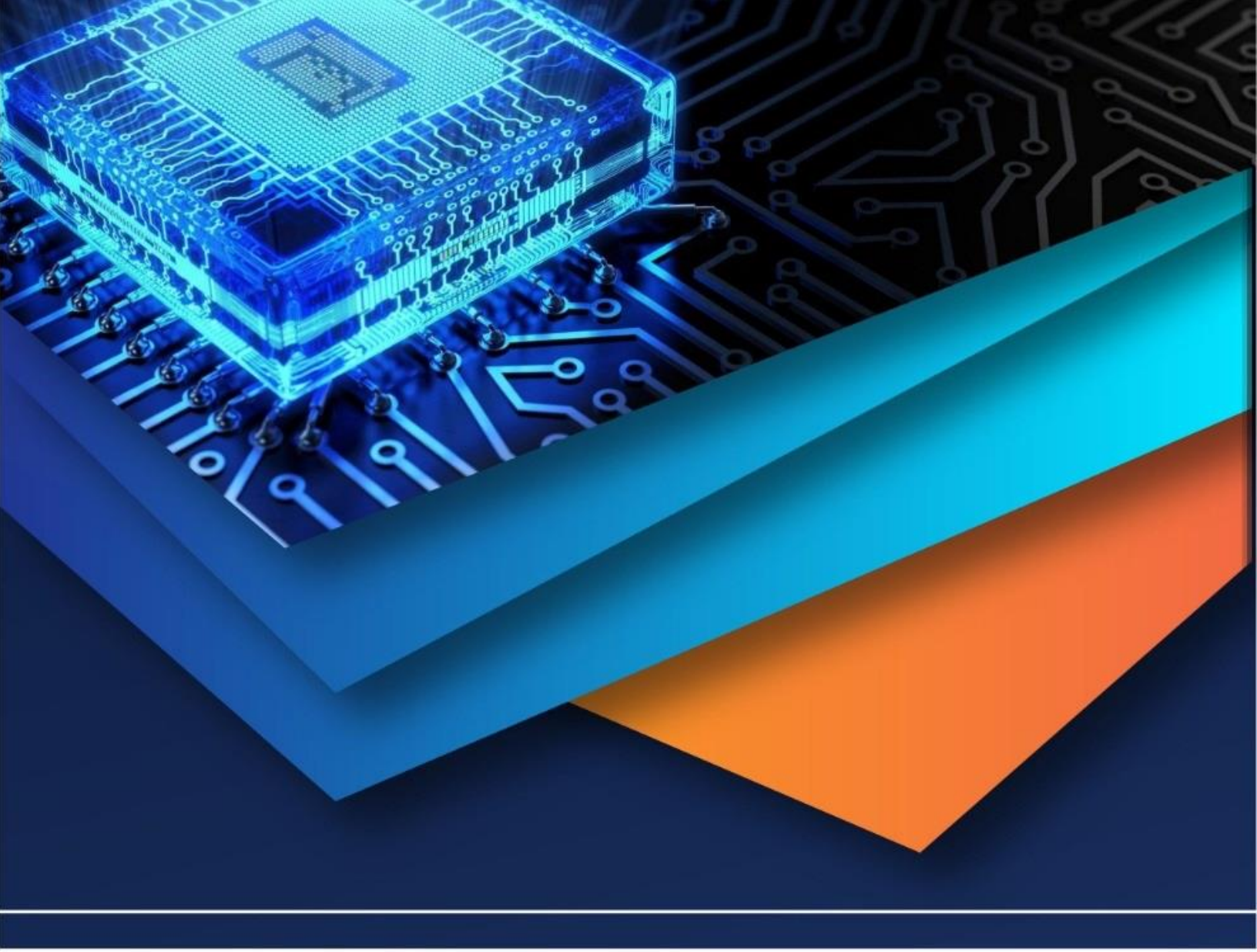
V. CONCLUSION

This prospective observational study included 64 adult patients with Alcoholic Liver Disease (ALD), encompassing both diabetic and non-diabetic individuals. The study aimed to assess the effectiveness of various screening tools, treatment approaches, and their impact on patient outcomes. We utilized standardized screening tools like the Alcohol Use Disorder Identification Test (AUDIT) and the CAGE questionnaire to evaluate alcohol consumption patterns and identify potential Alcohol Use Disorder (AUD). The treatment regimen primarily comprised nutritional support, alcohol abstinence, and pharmacological interventions like ursodeoxycholic acid, antibiotics, and benzodiazepines. A significant proportion of patients experienced alcohol withdrawal symptoms, including behavioral changes, gastrointestinal disturbances, and neurological manifestations. The study revealed that patients with compensated liver disease exhibited significant improvement with a combination of abstinence, nutritional therapy, and pharmacological interventions. However, for patients with advanced or decompensated liver disease, liver transplantation emerged as a viable therapeutic option.

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