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A Prospective Study On Severity Risk Assessment And Management Of Alcoholic Liver Disease And Its Complications: Observational And Prospective Study

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Abstract
Background: *Alcohol-related health disorders are significant global public health issues, accounting for 3.8% of total deaths. Alcoholic liver disease (ALD) contributes to 9.5% of alcohol-related disability-adjusted life years. This study evaluates the clinical profile, complications, management, and prognostic assessment of ALD.*
Aim: *To assess complications and management of ALD along with prognostic evaluation.*
Materials and Methods: A prospective study involving 45 patients with ALD over seven months collected demographic data, lab investigations, liver function tests, Child-Pugh-Turcotte, and MELD scores. The study correlated clinical complications, biochemical parameters, and in-hospital mortality with patients' alcohol intake.
Results: *The cohort's mean age was 47.6 years, with a majority being male. The average duration of alcohol intake was 20.7 years. Common clinical presentations included ascites (55.5%) and jaundice (64%). Complications such as portal hypertension (62.2%) and esophageal varices (51.1%) were prevalent, with most patients classified as Child-Pugh class C (64.4%). A dose-dependent relationship was noted between complications, prognostic markers (MELD and Child-Pugh scores), and alcohol duration, while the type of alcohol had minimal impact. Pentoxifylline showed greater efficacy than corticosteroids for Child-Pugh classes B and C. Common prescriptions included lactulose (60%), rifaximin (51.1%), and thiamine (55.5%).*
Conclusion: *Alcohol-related liver diseases present serious health risks with high short-term mortality. Portal hypertension is the most common complication. Effective management of complications can significantly reduce morbidity and mortality in ALD patients.*
Keywords-*alcoholic liver disease, liver function test, meld, child-Pugh score*

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I. Introduction

Overview of Alcoholic Liver Disease (ALD)

ALD includes liver conditions caused by excessive alcohol consumption, leading to fat accumulation, inflammation, and scarring. It progresses from hepatic steatosis (fatty liver) to alcoholic hepatitis (inflammation) and, ultimately, to alcoholic cirrhosis (irreversible damage). (1)

Histological Stages of ALD

- **Alcoholic Fatty Liver Disease**: Fat droplets in liver cells, often asymptomatic and reversible with abstinence.
- **Alcoholic Hepatitis**: Severe inflammation that worsens with continued drinking.
- **Alcoholic Cirrhosis**: Chronic scarring leading to liver failure, irreversible but preventable with abstinence.(2)

Global Impact of ALD

The WHO reports 3 million alcohol-related deaths globally (2016), with liver diseases contributing significantly. In India, ALD causes approximately 268,580 deaths annually, 3.17% of all deaths.(3)

Risk Factors for ALD

- **Alcohol Quantity**: 60–80 grams/day for men, 20 grams/day for women increases liver damage risk.
- **Drinking Patterns**: Drinking outside meal times increases risk.
- **Sex Differences**: Women are more vulnerable to alcohol-related liver damage.

- **Co-existing Conditions**: Hepatitis C and iron overload worsen liver damage.
- **Nutritional Status**: Malnutrition and deficiencies (e.g., vitamins A and E) contribute to damage.
- **Obesity and Genetics**: Obesity and genetic factors increase risk.
- **Binge Drinking**: Significantly raises the risk of alcoholic hepatitis.(4)

Complications of Alcoholic Hepatitis
- **Varices**: Enlarged veins causing bleeding.
- **Ascites**: Fluid buildup, often infected.
- **Hepatic Encephalopathy**: Toxic buildup causing confusion and coma.
- **Kidney Failure and Portal Hypertension**: Due to liver function deterioration.

Clinical Presentation and Evaluation
Patients may present with jaundice, fever, and abdominal swelling. Diagnosis includes:
- **Tests**: LFTs, ascitic fluid analysis, endoscopy for varices.(1)

Management and Treatment
- **Immediate Abstinence**: Key to survival and disease prevention.
- **Nutritional Support**: Critical due to common malnutrition.(5)
- **Medications**: Corticosteroids, pentoxifylline, and antioxidants like N-acetylcysteine.(6)

Prognostic Assessment
Common scoring systems:
- **MELD Score**: Assesses liver function.
- **Child-Pugh Score**: Classifies liver disease severity (A, B, C).

Conclusion
Early diagnosis and treatment of ALD improve patient outcomes, prevent progression, and manage complications.

II. Methodology

A prospective, observational study was conducted in the department of emergency, general medicine, and critical care departments., Bangalore Baptist hospital, Bangalore from June 2023 to November 2023, on chronic kidney disease patients having anemia.

Inclusion Criteria:
1. In-patients with alcoholic liver disease (ALD).
2. Diagnosed with ALD.
3. Aged above 18.
4. Previously diagnosed and admitted with complications.
5. Risk score assessed.
6. In the intensive care unit (ICU) with severe ALD.

Exclusion Criteria:
1. Patients with non-alcoholic liver disease.
2. Patients under 18 years.
3. Pregnant women.

III. Result

The study comprised of 45 patients. Demographic variables were assessed. The maximum number of patients was aged between 31-40 years of age, with male gender predominance.

The majority of patients in this study were whiskey drinkers, with an average alcohol intake duration of 20 years, and no significant differences among liquor groups. Among 45 patients, 64.4% had icterus, 24.4% had pallor, and 37.77% had edema. The most common complications were portal hypertension (62.22%) and ascites (55.55%), followed by esophageal varices (51.11%), encephalopathy (20%), and alcohol withdrawal syndrome (20%). Based on the Child-Pugh scoring system, most patients were in severity class C (64.4%), followed by class B (20%) and class A (2.2%). MELD scoring showed a range of 1-40 points among patients. Medication usage included rifaximin (57.8%), lactulose (66.7%), thiamine (66.7%), hepakart (37.8%), spironolactone (51.1%), and others. Lab parameters significantly improved from admission to discharge, highlighting the importance of tailored treatment approaches in managing ALD.

Table No .01- Age & Gender Distribution Of Patients Enrolled In The Study

Parameters	No. Of Patients		Percentage
Age Group (Years)	20-30	1	2.22
	31-40	16	35.55
	41-50	12	26.6
	51-60	10	22.2
	61-70	4	8.8
	71-80	2	4.4
Age Mean ± Sd	47.59±10.45		
Gender	Male	44	98
	Female	1	2

Table No.02: Effect Of Duration Of Alcohol Exposure -Complications Rate, Prognostic Marker.

		Up To 10 Yr (N=8)	11-20 Yr(N=9)	>20(N=9)
	Encephalopathy	2(25%)	2 (22.2%)	4(44.4)
Complications	Ascites	6(75%)	5(55.5%)	3(33.3%)
	Gi Bleed	5(62.5%)	5(55.5%)	5(55.5%)
Prognosis And Outcome(Mean)	Meld Score	22.5	23	22
	Child-Pugh	10.6	10.6	10.6

Table No 03: Comparison Of Patients Drinking Different Alcoholic Beverages – Complications Rate, Prognostic Markers

		Whiskey (N=6)	Beer(N=3)	Brandy (N=3)
Complications	Encephalopathy	1(16.7%)	0	0
	Ascites	3(50%)	3 (100%)	2(66.67%)
	Gi Bleed	5(83.3%)	2(66.7%)	2(66.67%)
Prognosis Outcome(Mean)	Meld Score	19.2	22	0
	Child-Pugh	10.6	10	12

Table No.04: Effect Of The Amount Of Alcohol Exposure Complications Rate And Prognostic Marker

	Ml/Day	<250 (N=8)	250-500(N=3)	>500(N=2)
Complication	Encephalopathy	2 (25%)	0	0
	Ascites	4(50%)	2(66.7%)	1(50%)
	Gl Bleed	6(75%)	1(33.3%)	1(50%)
Prognosis And Outcome(Mean)	Meld Score	20.2	29	20.2
	Child-Pugh	10.6	10	9

Table 05: Measurement Of The Vitals In All The Enrolled Patients

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Vitals	No.0f Patients	Percentage
Icterus	29	64.4
Pallor	11	24.4
Edema	17	37.77

Table No.06: Occurrence Of The Complications In Patients

Complications	No. Of Patients	Percentage
Portal Hypertension	28	62.22
Esophageal Varices	23	51.11
Ascites	25	55.55
Encephalopathy	9	20
Alcohol Withdrawal Syndrome	9	20

Table No.07: Assessment Of Severity Using The Child-Pugh Scoring System

Child Pugh	No. Of Patients	Percentage	1-Year Survival
Class A	1	2.2	100%
Class B	9	20	80%
Class C	29	64.4	45%

Table No.08– Severity Assessment Using Meld Scoring System

Meld Points	No. Of Patients	Percentage
1 - 10	2	4.44
11 -20	5	11.11
21 - 30	10	22.22
31 -40	1	2.22
> 40	1	2.22

Table No.09 - List Of Medication Prescribed To Patients During Their Stay In The Hospital

Medications	Number Of Patients	Percentage
Rifaximin	**26**	**57.8**
Lactulose	**30**	**66.7**
Thiamine	**30**	**66.7**
Spironolactone	**23**	**51.1**
Hepakart	**17**	**37.8**
Furosemide	**5**	**11.1**
Pentoxifylline	**8**	**17.8**
Multivitamin	**28**	**62.2**
Vitamin K	**10**	**22.2**
Carvedilol	**12**	**26.7**
Steroids	**4**	**8.9**
Potassium Chloride	**9**	**20**
Human Albumin	**9**	**20**
Folic Acid	**1**	**2.2**
Antiepileptics	**2**	**4.4**
Benzodiazepines	**7**	**15.6**

Table no.10- laboratory parameters of the enrolled patient on the date of admission and discharge

Liver Function Test	Admission Date(Mean)	Discharge Date(Mean)
Total Protein Serum	5.6	6.1
Ggt	198.5	157.6
Alkaline Phosphate Serum	144.3	140.9
Direct Bilirubin	7.6	6.3
Total Bilirubin	11.2	9.8
Serum Albumin	2.5	2.5
Aspartate Transaminase	132.4	89.9
Alanine Transaminase	161.2	140.2

IV. Discussion

1. **Gender Distribution**: Out of 45 patients, 97.77% were male (44 patients), and 2.22% were female (1 patient), indicating a higher prevalence of ALD among males.

2. **Age Group Distribution**: Patients' ages ranged from 20-80 years, with the majority falling in the 31-40 years age group (35.55%). The lowest number of patients was in the 20-30 age group (2.22%). The mean age was 47.4 years. The total mean age of the study population is 47.4 years this was consistent with the study conducted by Nitya and et.al with a mean age of 46.2 years. (Nand, Malhotra and Dhoot, 2015).(10)

3. **Occurrence of Complications**: Common complications included:
   - **Icterus (jaundice)**: 64.4%
   - **Edema**: 37.77%
   - **Pallor**: 24.4%
   - **Portal hypertension**: 62.22%
   - **Ascites**: 55.55%
   - **Esophageal varices**: 51.11%
   - **Alcohol withdrawal syndrome**: 20%
   - **Encephalopathy**: 20%

   Jaundice and portal hypertension were the most frequent complications. the present study is consistent with a previous study conducted by Revathyet et.al regarding the proportion of different complications.(7)

4. **Severity of Liver Cirrhosis**: Based on Child-Pugh scoring:
   - Class C: 64.4%
   - Class B: 20%
   - Class A: 2.2%

MELD scoring showed the majority in the range of 21-31 points, indicating severe stages of liver disease.

5. **Medications Prescribed**:
   - **Lactulose**: 60%
   - **Rifaximin**: 51.11%
   - **Thiamine**: 55.5%
   - **Hepakart**: 28.88%
   - **Spironolactone**: 37.77%
   - **Furosemide**: 11.1%
   - **Pentoxifylline**: 17.77%
   - **Multivitamin**: 35.55%
   - **Vitamin K**: 22.22%
   - **Carvedilol**: 17.77%
   - **Steroids**: 8.88%
   - **KCL**: 11.1%
   - **Albumin**: 20%
   - **Hepatic drugs**: 11.1%
   - **Antiepileptic drugs**: 4.45%
   - **Benzodiazepines**: 15.5%

Pentoxifylline was seen as more effective than corticosteroids for patients with Child-Pugh class B, which is consistent with the previous study conducted by Binay Krishna et al**.** (8)

Albumin with diuretics improved ascites and LFT values, while Vitamin K improved coagulopathy. which is consistent with a previous study conducted by Paolo Gentilini et.al.(9)

6. **Alcohol Consumption Data**: Complications and prognostic markers didn't vary by alcohol intake amount but correlated with types of alcohol consumed. Encephalopathy was significantly higher in patients drinking for over 20 years. the present study is not consistent with the previous study conducted by Nitya and et. al(Nand, Malhotra and Dhoot, 2015).(10)

7. **Lab Parameters**: LFT values improved significantly from admission to discharge for all enrolled patients

This study highlights the importance of appropriate management and tailored treatment approaches to reduce morbidity and mortality in ALD patients.

V. Conclusion

in this study of 45 patients with a mean age of 47.6 years, predominantly male and mostly under severity class C with high mortality risk, several key findings were observed. Complications and prognostic markers did not vary based on the amount of alcohol intake but did correlate with the types of alcohol consumed. Additionally, the duration of drinking did not significantly affect complications and prognostic markers. The most common complications among these patients with Alcoholic Liver Disease (ALD) were portal hypertension and ascites. Hospital prescribing patterns were efficient according to Liver Function Test (LFT) values, with albumin and diuretics improving ascites and LFT values. Pentoxifylline was found to be more effective than corticosteroids in patients with Child-Pugh class B and C. The study highlights that proper management of complications can reduce morbidity and mortality in ALD patients. Overall, the findings emphasize the importance of tailored treatment approaches for improving outcomes in ALD patients.

Declarations
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Ethical approval: The study was approved by the Institutional Ethics committee

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