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Prospective Observational Study on Clinical and Biochemical Investigations Of Ethanol Induced Liver Diseases

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KEYWORDS

Alcoholic Liver Disease, score, Steatosis, Cirrhosis, Biochemical marker

ABSTRACT:

Alcoholic liver disease (ALD) is a growing concern globally, with increasing rates of illness and death. The prognosis of ALD depends on several factors, including the extent of liver damage, the presence of complications, and the duration and quantity of alcohol consumption. This summary aims to provide an overview of the current evidence on the clinical and biochemical features of ALD, including how mortality is evaluated using the Model for End-Stage Liver Disease (MELD) score and Child-Pugh score among ALD patients. Clinical studies have shed light on the multifaceted nature of ALD, spanning various stages from steatosis to steatohepatitis, fibrosis, cirrhosis, and even hepatocellular carcinoma. Biochemical investigations have uncovered underlying mechanisms of ALD pathogenesis, such as oxidative stress, inflammation, and disruptions in lipid metabolism. Additionally, research emphasizes the critical importance of early detection and intervention to halt disease progression. We collected data on patient demographics, alcohol consumption, liver function tests, MELD score, Child-Pugh score, and mortality rates.

1. Introduction

The liver plays a crucial role in regulating various physiological functions, including metabolism, secretion, and storage. Additionally, it serves as the primary organ for detoxifying xenobiotics and drugs. Consequently, the onset of liver diseases can lead to serious health complications [1]. These conditions encompass degenerative disorders like cirrhosis, acute or chronic inflammatory liver diseases such as hepatitis, and non-inflammatory ailments like hepatosis. Liver disorders can arise from infections, autoimmune conditions, excessive alcohol consumption, or exposure to toxic substances like peroxidized oil, drugs, antibiotics, chlorinated hydrocarbons, and carbon tetrachloride.Alcoholism and alcohol abuse pose significant global challenges[2,3] across diverse cultures. Alcoholic liver disease[4, 5] (ALD) stands out as a prominent cause of chronic liver damage worldwide, stemming from excessive alcohol intake and resulting in numerous fatalities. Overindulgence in alcohol often leads to hangovers the next day, manifesting as temporary physical and psychological symptoms like headaches, sweating, gastrointestinal discomfort, and fatigue. The accumulation of reactive oxygen species [6] (ROS) due to alcohol metabolism exacerbates liver damage by impairing the organ's antioxidant defenses.

Alcohol consumption, whether acute or chronic, results in hepatic steatosis in at least 80% of heavy drinkers [7]. This rapid accumulation of lipids in the liver represents one of the initial signs of alcoholic liver disease (ALD) onset [8]. However, this stage of alcohol-induced liver injury can be reversed promptly upon cessation of alcohol consumption (abstinence) [9]. Steatosis, is believed to prime the liver for progression to more severe pathologies when exposed to subsequent metabolic or other stressors [10].

While steatosis was initially believed to have no significant pathological impact, recent research suggests that it may play a crucial role not only in the initiation but also in the progression of alcoholic liver disease (ALD) [11]. Clinical studies have indeed shown that patients with fatty liver are at higher risk of developing

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advanced stages of the disease, such as fibrosis and cirrhosis [12]. However, due to an incomplete understanding of the underlying mechanisms involved in the disease process, there is still no universally accepted pharmacological therapy to prevent or reverse ALD in humans.These adverse effects arise from the metabolism of alcohol and its breakdown product, acetaldehyde [13, 14].While numerous allopathic medications have been created, the quest for an effective therapeutic solution for hepatotoxicity persists. Traditional medicine systems often employ plant-based formulations for liver disease treatment, yet only a handful of these formulations have undergone thorough evaluation for their pharmacological effectiveness [15]. Recent research has highlighted the effectiveness of these scores in guiding treatment decisions [16] and foreseeing outcomes in ALD patients, allowing for timely interventions like liver transplantation when necessary. Nonetheless, challenges persist in accurately predicting mortality in ALD, particularly considering comorbidities and complications [17]. Further investigation is necessary to refine existing scoring systems [18] and discover new biomarkers for better risk assessment and management of ALD patients.Implementing these insights into clinical practice can significantly improve patient care and outcomes within this vulnerable population.

2. Materials and Methods

Study site:

The present study was conducted in the department of general medicine at AC Subba Reddy government medical college, a 750 bedded tertiary care teaching hospital, Nellore, Andhra Pradesh.

Study design:

Our study design comprises, prospective observational study conducted in the ACSR government general hospital, a tertiary care teaching hospital, Nellore, Andhra Pradesh.

Duration of the study:

This study was conducted for six months, from September 2023 to February2024.

Source of data:

From patient case sheets and patient interview, questionnaire includes demographic variable and physical examination.

Study of population:

This study involves total subjects of 180 only inpatients, according to inclusive and exclusive criteria.

Statistical analysis:

Data was input into an Excel sheet on Microsoft. The data was analyzed using descriptive statistics. The proportion of the results was reported.

Patient selection criteria:

Patient according to their alcohol consumption as well as the inclusion and exclusion criteria

Criteria for inclusion:

- Individuals ranging in age from18 to >80.
- Male patient suffering from long-term liver damage. (found to have cirrhosis)
- Patients who are ready to provide permission
- Patients who receive six months of routine follow-up
- History or present encephalopathy, variceal bleeding, and ascites.

Criteria for exclusion:

- Ages below 18 are not included.
- Pregnant ladies and pediatricians are not included.
- Individuals with sporadic follow-up
- Patient in psychiatry with cognitive decline
- Patients unwilling to provide permission

3. Results

Table 1: Data distribution based on personal history

Personal habitat	No. of patients	Frequency
Alcoholic	180	100
Smoker	92	51.1
Nonsmoker	88	48.8

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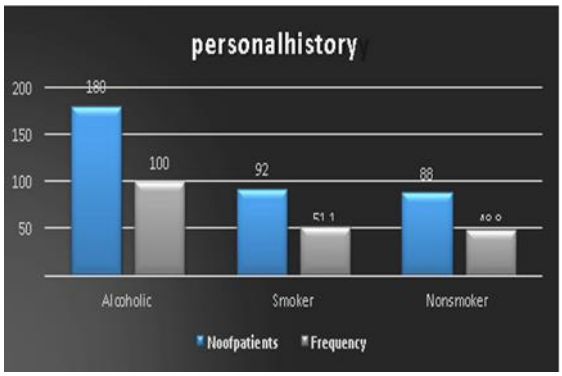

Fig 1: Data distribution based on personal history

Table 2: Data distribution of Cause for Hospitalization

Cause for hospitalization	No. of patients	Frequency
Loose stool, decreased urine output.	15	8.3
SOB, orthopnea	35	19.4
Pedal edema or facial swelling	60	33.3
Abdominal distension	160	88.8
Discoloration of eyes, skin, discoloration of urine	75	44.4
Itching of the skin	25	13.8
Chest pain or heart failure	15	8.3
Anorexia, weight loss	82	45.5
Hypertension	85	47.22
Vomiting, dizziness	68	37.7

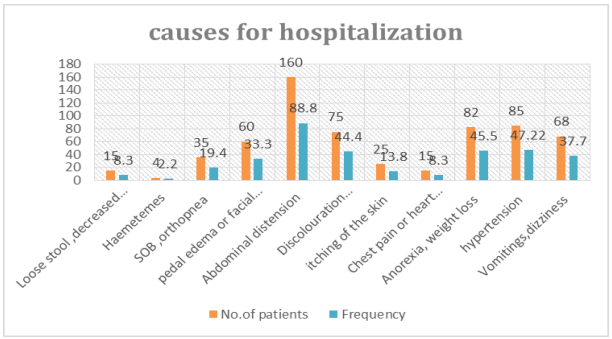

Fig 2: Data distribution based on Cause for Hospitalization

Table 3: Data distribution based on clinical diagnosis

Test advised for the liver disease patients	No.of patients	Frequency
Complete blood picture (CBP)	180	100
Liver function test(LFT)	180	100
Renal function test (RFT)	85	47.2
USG abdomen	180	100
Liver biopsy	52	28.8
Viral Serology test	72	40
Complete urine examination (CUE)	160	88.8
Magnetic resonance imaging, MRI	55	30.5
CT SCAN	60	33.3

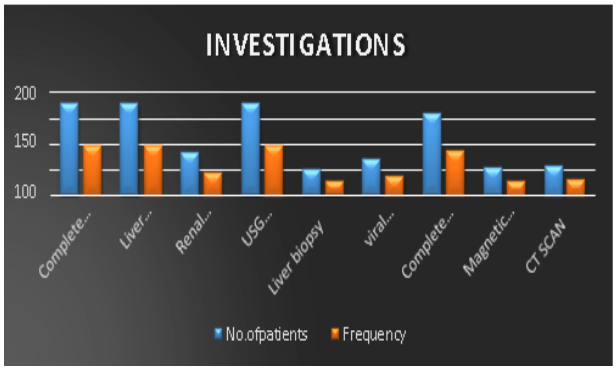

Fig 3: Distribution of data based on diagnosis

Table 4: Data distribution based on diseases

Characteristics	No. of patients	Frequency
Hepatomegaly	55	30.5
Hepatitis	44	24.4
cirrhosis	54	30
Liver abscess	27	15

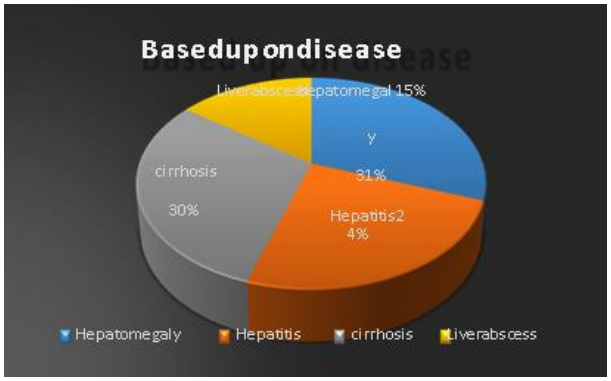

Fig 4: Distribution of data based on Diseases

Table 5: Data distribution based on complications

Complications	No. of patients	Frequency
Ascites	43	23.8
Jaundice	75	44.4
Esophageal varices	140	77.7
Portal hypertension	110	61.11
Hepatic encephalopathy	42	23.3

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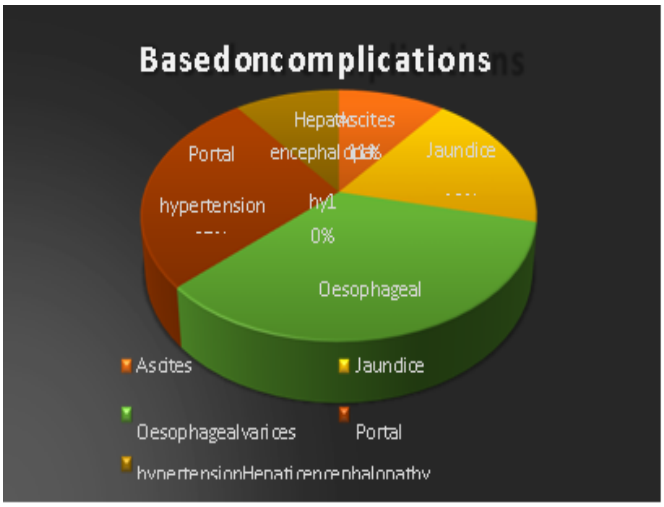

Fig 5: Distribution of data based on Complications

Table 6: Correlation of data based on ALT, AST& Serum bilirubin

Diseases	ALT (SGPT), 7 to 55 U/L	AST (SGOT), 8 to 48 U/L	Serum bilirubin, 0.1 to 1.2 mg/dl
Hepatomegaly	112	120	0.8
Hepatitis	110	135	0.8
Cirrhosis	170	180	1
Jaundice	119	115	2
Ascites	200	240	1.2
Liver abscess	72	64	0.9
Liver carcinoma	190	210	1.9

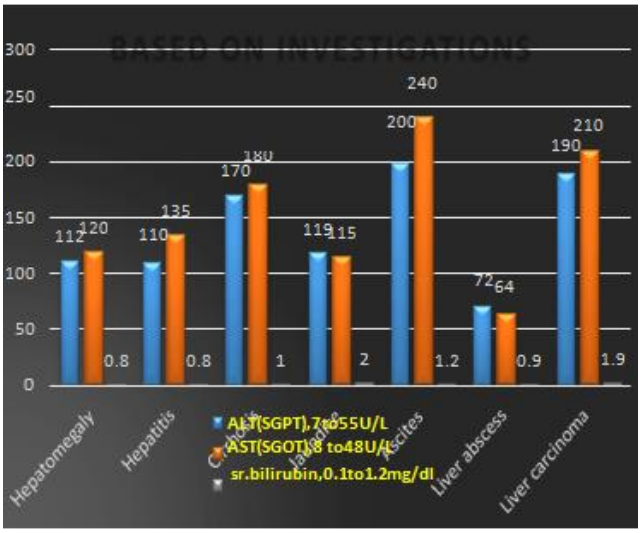

Fig 6: Distribution of data based on Investigations

Table 7: Data distribution based on management of Liver disease

Classification and drugs	No. of patients	No. of patients	Frequency
1.VITAMIN SUPPLEMENTS Vitamin B,Vitamin K, MVT	160 65 120	160 65 120	88.8 36.1 66.6
2.ANTIBITOTICS Ceftriaxone Metronidazole, Augumentin Refaximine	78 25 32 50	78 25 32 50	48.3 13.3 17.7 27.7
3.ANTIVIRALS Acyclovir, Adefovir, Tenofovir, Entecavir	26 5 4 3	26 5 4 3	14.4 2.7 2.2 1.6
4.ANTIEMETICS Ondansetron, Domperidone	48 26	48 26	26.6 14.4
5.Secondary biliary agents-UDCA	90	90	50
6.HEPATO PROTECTORS Hepamerz (l-ornithine and Lasparate)	89	89	49.4
7.BETA BLOCKERS PropranololAtenolol Metoprolol succinate	58 15 11	58 15 11	32.2 8.3 6.11
8.ANTIFUNGALS Itraconazole, Amphotericin B, Clotrimazole	4 21 3	4 21 3	2.22 11.1 1.6
9.LAXATIVES Duphalac,	23 12	23 12	12.7 6.6
10.NSAIDS (Opioid analgesics) Tramadol	24	24	13.3
11.Proton pump inhibitors Pantoprazole, Omeprazole	140 40	140 40	77.7 22.2

Table 8: Data distribution on mortality rate based on the manifestations

Disease	Deaths	Frequency
Hepatomegaly	4	2.22
Hepatitis	12	6.66
Cirrhosis	18	10
Ascites	21	11.6
Jaundice	9	5
Liver abscess	7	3.8

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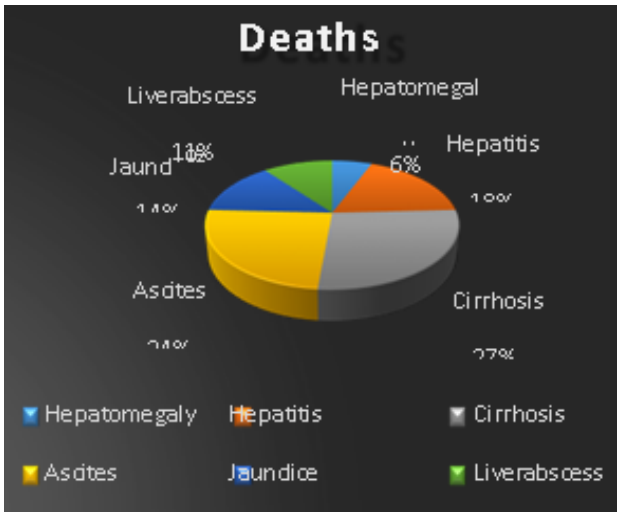

Fig 8: Distribution of data based on mortality rate

4. Discussion

This research delves into the perception surrounding the clinical examination of alcoholic liver diseases and aims to investigate both the radiological and biochemical changes occurring in patients afflicted with such conditions. Our prospective study thoroughly examines the clinical and biochemical aspects, striving to establish meaningful correlations between them. A cohort comprising 180 patients was meticulously scrutinized, revealing that alcoholic liver disease stands out as a significantly prevalent ailment compared to disorders affecting other organ systems, notwithstanding the grave complications that arise from prolonged alcohol consumption. Among these complications, gastroesophageal varices emerge as particularly severe, with potential mitigation through the use of proton pump inhibitors (PPIs). Furthermore, ascites emerges as a primary concern among cirrhotic patients. Our findings underscore the alarming reality that 39.28% of deaths are attributable to ethanol ingestion.

5. Conclusion

The study encompassed an examination of 180 patients, revealing the pervasive nature of alcoholic liver disease, which often goes overlooked compared to disorders affecting other organ systems. Despite its prevalence, this disease poses life-threatening complications stemming from prolonged alcohol consumption. Our prospective study focused on hospitalized ALD patients, collecting and analyzing data to explore the clinical and biochemical aspects of ethanol-induced liver disease. By employing liver function testing (LFT) and imaging studies, we assessed the impact of alcohol consumption on the development of ALD. The findings elucidate the diverse clinical manifestations associated with the condition and highlight abnormalities in LFT observed in alcoholic liver disorders. Moreover, the study emphasizes the importance of addressing alcohol misuse and receiving comprehensive care to mitigate the progression of alcoholic liver disease and improve overall health.

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