RESEARCH PAPER

Assessment Of Prevalence, Risk Factors And Severity Of Disease In Alcoholic And Non-Alcoholic Liver Disease In a Tertiary Care Hospital

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ABSTRACT

Alcoholic liver disease (ALD) and non-alcoholic fatty liver disease (NAFLD) are important causes of chronic liver disease and may progress from hepatic steatosis to steatohepatitis, fibrosis, cirrhosis and hepatocellular carcinoma. ALD is associated primarily with the amount and duration of alcohol exposure, whereas NAFLD is strongly associated with metabolic risk factors including obesity, type 2 diabetes mellitus, dyslipidemia, hypertension and insulin resistance. The present prospective observational study is designed to assess the prevalence, identify major risk factors and compare disease severity among patients with alcoholic and non-alcoholic liver disease attending a tertiary care hospital in Khammam. A minimum of 360 patients will be evaluated over a six-month study period. Patient demographics, alcohol-use history, lifestyle factors, comorbidities, clinical findings and relevant laboratory information will be collected using a prepared questionnaire. Severity will be assessed using established clinical scoring systems, including the Model for End-stage Liver Disease (MELD), Child-Pugh score and FIB-4; AUDIT-C will be used for assessment of alcohol consumption. The study is expected to identify major demographic, metabolic and lifestyle factors associated with disease occurrence and progression and to facilitate comparison of severity between alcoholic and non-alcoholic liver disease.

Keywords: alcoholic liver disease; non-alcoholic fatty liver disease; NAFLD; NASH; alcohol consumption; metabolic syndrome; liver fibrosis; MELD; Child-Pugh; FIB-4.

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INTRODUCTION

Alcoholic liver disease (ALD) is a major cause of morbidity and mortality and represents a spectrum ranging from alcoholic fatty liver to alcoholic hepatitis and cirrhosis. Chronic and excessive alcohol consumption can impair hepatic metabolism and promote hepatocellular injury through mechanisms that include acetaldehyde toxicity, oxidative stress and mitochondrial dysfunction. The amount and duration of alcohol exposure are important determinants of disease risk and severity.

Non-alcoholic fatty liver disease (NAFLD), increasingly described within the broader concept of metabolic dysfunction-associated steatotic liver disease, is characterized by excess hepatic fat in individuals without heavy alcohol consumption. It is closely associated with obesity, central adiposity, insulin resistance, type 2 diabetes mellitus, dyslipidemia, hypertension and metabolic syndrome. The disease spectrum extends from simple steatosis to steatohepatitis, fibrosis, cirrhosis and hepatocellular carcinoma.

Both ALD and NAFLD are increasingly recognized as major public-health problems. Although hepatic steatosis is common to both conditions, their underlying mechanisms and clinical trajectories differ. Metabolic risk factors can coexist with alcohol exposure, making clinical characterization and comparison important in routine practice.

Non-invasive clinical and laboratory-based scores can assist in identifying patients at increased risk of advanced liver disease. MELD and Child-Pugh scores are commonly used to assess severity and prognosis in advanced liver disease, while FIB-4 is useful for estimating the likelihood of significant

fibrosis. AUDIT-C provides a structured approach to assessing alcohol consumption.

The present study therefore aims to assess the prevalence, identify risk factors and compare the severity of alcoholic and non-alcoholic liver disease among patients attending a tertiary care hospital.

PATHOPHYSIOLOGY AND CLINICAL SPECTRUM

Alcoholic liver disease progresses through three broad clinical stages: alcoholic steatosis, alcoholic hepatitis and alcoholic cirrhosis. Steatosis is the most common early manifestation and may be asymptomatic. Continued heavy alcohol exposure may result in inflammatory injury and, in susceptible individuals, irreversible fibrosis and cirrhosis.

Alcohol is metabolized to acetaldehyde, a reactive metabolite capable of forming protein and lipid-derived adducts. These processes, together with oxidative stress and mitochondrial dysfunction, contribute to hepatocyte injury and inflammatory responses. Alcohol abstinence is an important component of management, while advanced disease may require specialized treatment and, in selected patients, liver transplantation.

NAFLD is characterized by accumulation of hepatic triglycerides and may progress to steatohepatitis, fibrosis and cirrhosis. Obesity, insulin resistance, type 2 diabetes, dyslipidemia, hypertension, sedentary lifestyle and calorie-dense dietary patterns are important associated factors. Histological assessment by liver biopsy remains a reference method for characterizing steatohepatitis and fibrosis, although non-invasive approaches are widely used in clinical practice.

RISK FACTORS

Important risk factors described in the supplied manuscript include the quantity and duration of alcohol consumption, sex, hepatitis C infection, genetic susceptibility such as PNPLA3 variation, obesity and nutritional/metabolic factors for ALD. For non-alcoholic liver disease, major risk factors include central obesity, insulin resistance, type 2 diabetes mellitus, dyslipidemia, hypertension, sedentary lifestyle and dietary patterns rich in sugars and saturated fats.

Patients may be asymptomatic in early disease. With progression, clinical manifestations may include fatigue, jaundice, ascites, edema, hepatic encephalopathy, abdominal distension and right-upper-quadrant discomfort.

ASSESSMENT OF DISEASE SEVERITY

The study will use validated scoring systems to support assessment of liver-disease severity and risk. MELD and Child-Pugh scores will be used for severity assessment where applicable, FIB-4 will be used to estimate fibrosis risk, and AUDIT-C will be used to characterize alcohol consumption. The use of standardized scores is intended to improve comparability between alcoholic and non-alcoholic liver disease groups.

AIM AND OBJECTIVES

Aim: To assess the prevalence, risk factors and severity of alcoholic and non-alcoholic liver disease and to compare the clinical characteristics of affected patients attending a tertiary care hospital.

- To identify patient groups at increased risk according to age and other demographic characteristics.
- To assess the relationship between alcohol type, beverage pattern and alcohol exposure and liver disease.
- To compare patients with alcoholic and non-alcoholic liver disease with respect to risk factors and disease severity.
- To identify important comorbidities associated with disease progression.
- To assess the contribution of dietary and lifestyle factors and support counselling regarding appropriate lifestyle modification.
- To identify factors associated with increased morbidity and mortality risk.

NEED FOR THE STUDY

- ALD and non-alcoholic liver disease are important causes of chronic liver disease and are associated with increasing metabolic and lifestyle-related risk factors.
- Identification of modifiable risk factors may support early intervention, patient education and prevention of disease progression.
- A prospective observational assessment can provide systematic information on patient demographics, lifestyle characteristics, comorbidities and clinical severity within the study population.

LITERATURE REVIEW

Pouwels et al. (2022) reviewed NAFLD pathophysiology and clinical management and highlighted its association with obesity, type 2 diabetes mellitus, dyslipidemia, hypertension and insulin resistance. Lifestyle modification, dietary improvement, physical activity and weight loss remain central components of management.

Golabi et al. (2022) evaluated causes of chronic liver disease mortality and reported substantial liver-related mortality among patients with NAFLD and other chronic liver diseases, emphasizing the importance of identifying patients at risk of adverse outcomes.

Zarghamravanbakhsh et al. (2021) discussed metabolic causes and consequences of NAFLD and emphasized that alcohol abstinence remains central to management of alcohol-associated liver disease,

while dietary and pharmacological strategies may support selected patients.

Jarvis et al. (2020) examined metabolic risk factors for severe liver outcomes and identified type 2 diabetes, obesity, hypertension and lipid abnormalities as important predictors of adverse liver outcomes.

Tanaka et al. (2019) described the increasing contribution of sedentary lifestyles and dietary patterns to NAFLD and discussed the multiple-hit concept, including hepatic lipid accumulation and the gut-liver axis.

Al-Dayyat et al. (2018) described NAFLD as closely associated with metabolic syndrome and emphasized obesity, insulin resistance, dyslipidemia, hyperglycemia, high intake of simple sugars and physical inactivity as important risk factors.

Le et al. (2017) examined NAFLD prevalence and progression to severe fibrosis and highlighted the importance of fibrosis severity in determining mortality risk.

Clemente et al. (2016) reviewed pediatric NAFLD and reported associations with childhood obesity, dietary factors including fructose intake, and genetic and environmental influences.

Younossi et al. (2016) described the epidemiology of NAFLD and NASH and reported frequent associations with obesity, type 2 diabetes, metabolic syndrome, hypertension and hyperlipidemia. Cardiovascular disease was identified as an important cause of mortality among patients with NAFLD.

Ursic-Bedoya et al. (2015) reviewed liver transplantation for alcoholic liver disease and highlighted the effectiveness of transplantation in advanced disease while noting the continuing importance of relapse prevention and management of alcohol dependence.

Zezos and Renner (2014) discussed transplantation in NASH-related cirrhosis and reported generally favorable post-transplant survival, while emphasizing that metabolic syndrome may persist after transplantation and that lifestyle modification remains important.

Koehler et al. (2013) described NAFLD as an increasingly common chronic liver disease in the setting of obesity and type 2 diabetes epidemics and highlighted the importance of differentiating simple steatosis from NASH and clinically important fibrosis.

MATERIALS AND METHODS

Study design: Prospective observational study.

Study site: Tertiary care hospital, Khammam, Telangana, India.

Study duration: Six months.

Sample size: Minimum of 360 patients.

Source of data: Patients with alcoholic and non-alcoholic liver disease attending the study site.

Data collection tool: A prepared questionnaire will be used to record demographic, clinical, lifestyle, alcohol-use and relevant medical-history information.

ELIGIBILITY CRITERIA

Inclusion criteria. Patients with ALD who report continuous significant alcohol intake and patients with non-alcoholic liver disease with abnormal laboratory findings, with or without clinical evidence of liver disease, will be considered. The supplied protocol also lists patients with jaundice, hepatomegaly, fatty-liver signs and selected metabolic or systemic comorbidities.

Exclusion criteria. Psychiatric patients, pregnant women, infants and neonates will be excluded.

STUDY VARIABLES AND SEVERITY ASSESSMENT

- Demographic variables: age and sex.
- Alcohol-related variables: type of beverage, alcohol consumption pattern, amount and duration of exposure.
- Metabolic and lifestyle variables: body weight/BMI where available, central obesity, diabetes, hypertension, dyslipidemia, diet and sedentary lifestyle.
- Clinical variables: symptoms, signs, comorbidities and relevant medical history.
- Severity measures: MELD, Child-Pugh, FIB-4 and AUDIT-C, as applicable to the individual patient.

STATISTICAL ANALYSIS

Data will be entered in a suitable database and analyzed using appropriate descriptive and inferential statistical methods. The statistical approach will be selected according to the distribution and type of variables and the study objectives. Continuous variables will be summarized using appropriate measures of central tendency and dispersion, while categorical variables will be summarized using frequencies and percentages. Appropriate tests will be used to compare alcoholic and non-alcoholic liver disease groups.

ETHICAL CONSIDERATIONS

Institutional Ethics Committee approval will be sought before commencement of patient recruitment. Patient information will be collected and handled in accordance with applicable ethical requirements and institutional procedures. The supplied protocol identifies the study as prospective and observational.

PLAN OF WORK

1. Selection of study site.
2. Collection and review of literature related to the study.
3. Designing of the study protocol.

4. Obtaining Institutional Ethics Committee approval.
5. Collection of patient demographic and medical-history data.
6. Collection of required information using the prepared questionnaire.
7. Assessment of risk factors and severity in alcoholic and non-alcoholic liver disease.
8. Statistical analysis and interpretation of the obtained data.

EXPECTED OUTCOMES

- Estimate the prevalence of alcoholic and non-alcoholic liver disease within the study population.
- Identify important demographic, metabolic, lifestyle and comorbidity-related risk factors.
- Compare the severity of disease between alcoholic and non-alcoholic liver disease groups.
- Identify age groups that may be more prone to disease.
- Assess the potential impact of liver disease on physical, physiological and social well-being.
- Generate information that may support early identification, patient counselling and prevention of disease progression.

CONCLUSION

This prospective observational study is designed to characterize the prevalence, risk factors and severity of alcoholic and non-alcoholic liver disease in a tertiary-care setting. By combining demographic and lifestyle information with clinical characteristics and validated severity scores, the study is expected to provide a practical comparison of disease patterns and associated risk factors. The findings may help identify patients at increased risk and reinforce the importance of early detection, alcohol-related counselling, metabolic-risk management and lifestyle modification.

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CONFLICT OF INTEREST

No conflict-of-interest

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