Presentation on

Study Of Inflammatory Markers And Liver Enzymes In Alcoholic And Metabolic Dysfunction-associated Steatotic Liver Disease

Dr. Deepti Bhatt

Research Scholar,

Department of Biochemistry,
Sai Tirupati University, Udaipur, Rajasthan, India

Dr. Ashwini Pravin Khairkar

Research Supervisor,
Department of Biochemistry,
Sai Tirupati University, Udaipur, Rajasthan, India

INTRODUCTION

- NAFLD and AFLD are leading causes of liver dysfunction globally.
- NAFLD: Linked to obesity, insulin resistance, dyslipidemia.
- AFLD: Caused by excessive alcohol intake.
- Both can progress to steatohepatitis, fibrosis, and cirrhosis if untreated.
- Inflammation is central markers like CRP, ESR, WBC reflect disease activity.
- Liver enzymes (ALT, AST, ALP) indicate hepatocellular and cholestatic injury; their patterns differ in NAFLD and AFLD.
- Objective: To compare inflammatory markers and enzyme profiles in NAFLD vs. AFLD, aiming to improve diagnosis and management. ---

AIMS AND OBJECTIVES:

AIM: The aim of this study is investigate the role of inflammatory markers (C-reactive protein [CRP], erythrocyte sedimentation rate [ESR], and white blood cell count [WBC]) and liver enzyme profiles (alanine aminotransferase [ALT], aspartate aminotransferase [AST], and alkaline phosphatase [ALP]) in patients with non-alcoholic fatty liver disease (NAFLD) and alcoholic fatty liver disease (AFLD) to identify potential differences in inflammatory response and liver function impairment between the two conditions.

OBJECTIVES –

1. To assess and compare inflammatory markers (CRP, ESR, and WBC) in NAFLD and AFLD patientsand determine their diagnostic significance
2. To assess and compare liver enzyme levels (ALT, AST, and ALP) in NAFLD and AFLD patients and determine their diagnostic significance.
3. To investigate correlations between inflammatory markers and liver enzyme levels in NAFLD and AFLD patients.
4. To assess the severity of liver damage based on biochemical markers in both conditions.
5. To contribute to the understanding of pathophysiological differences between NAFLD and AFLD for improved clinical diagnosis and management.

REVIEW OF LITERATURE

Chalasani et al. (2018), EASL–EASD–EASO (2016): Early detection & management guidelines for NAFLD; emphasize combined use of biochemical, imaging, and clinical tools.

Kowdley et al. (2012), Lieber (2004) AFLD—direct hepatotoxicity from alcohol; distinctive AST/ALT ratio. NAFLD—linked to metabolic risk factors.

Ridker (2003), Volzke et al. (2005) CRP as a sensitive, non-invasive biomarker for inflammation and predictor of NAFLD.

Targher et al. (2007), Bugianesi et al. (2005) Insulin resistance and systemic inflammation drive liver damage; carotid thickness relates to severity. **Adams et al. (2005)** NAFLD can progress from steatosis to fibrosis/cirrhosis—highlighting the importance of early intervention and monitoring. ---

RESEARCH METHODOLOGY

- **Design:** Observational, cross-sectional comparative study
- **Setting & Sample:** Dept. of Biochemistry, Pacific Institute of Medical Sciences, Udaipur
- **Total Patients:** 90 (45 NAFLD, 45 AFLD)
- **Sample Size Calculation:** Power analysis using G*Power 3.1 - Effect size (f): 0.53, $\alpha = 0.05$, Power = 0.80 - Required: 45 per group (Total 90)
- **Variables:**

❑ **Dependent:** Inflammatory Markers: CRP, ESR, WBC - Liver Enzymes: ALT, AST, ALP

❑ **Independent:** Disease group, alcohol intake, BMI, lipid profile, FBS, imaging

- **Inclusion Criteria:** Adults 18–70 years, diagnosis confirmed by imaging/biopsy, consent obtained
- **Exclusion Criteria:** Other liver diseases, severe obesity, acute infections, pregnancy, recent surgery, refusal of consent
- **Procedures:** Clinical & demographic data collection - Blood tests for biomarkers (using ERBA Mannheim XL, Elite 580, Beckmen DXH-560)
- **Data Analysis:** Descriptive stats, normality testing - t-test/Mann-Whitney U/Chi-square for group comparison - Correlation, regression, ROC curve (if applicable) - Significance at $p < 0.05$
- **Ethics:** Institutional approval, confidentiality maintained

CONCLUSION

- Inflammatory markers (CRP, ESR, WBC) and liver enzymes (ALT, AST, ALP) are critical for distinguishing NAFLD from AFLD and assessing disease progression.

- This study aims to clarify diagnostic differences between NAFLD and AFLD, supporting earlier and more accurate detection.

- Findings will enhance understanding of the pathophysiology and aid in developing targeted management strategies for fatty liver diseases.

- Results are expected to improve clinical decision-making and contribute to better patient outcomes in hepatic practice. ---

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