International Journal of Medicine
pISSN 1468-3814 | eISSN 2667-7008
https://theinternationalmedicine.com/

Original Researcher Article *DOI: 10.61336/im/26-4-37*

Correlation of Lymphocyte-to-Monocyte Ratio with Child–Pugh and Model for End-Stage Liver Disease Scores in Patients with Liver Cirrhosis: A Cross-Sectional Study.

[1]Dr. Mallolu Sai Krishna, [2]Dr. K. Umavani Hiranmayee, [3]Dr. D. Vijaya Lakshmi, [4]Dr. Komma Saitathagath, [5]Dr. Siripurapu Durga, [6]Dr. Veera Ashok, [7]*Dr.M. Ranga Raja Rao,

[1]Postgraduate, Department of General Medicine, Mamata Medical College, Khammam, Telangana.
[2] Associate Professor, Department of General Medicine, Mamata Medical College, Khammam, Telangana.
[3]Assistant Professor, Department of General Medicine, Mamata Medical College, Khammam, Telangana.
[4]Postgraduate, Department of General Medicine, Mamata Medical College, Khammam, Telangana.
[5]Postgraduate, Department of General Medicine, Mamata Medical College, Khammam, Telangana.
[6]Postgraduate, Department of General Medicine, Mamata Medical College, Khammam, Telangana.
[7] Professor and Head, Department of General Medicine, Mamata Medical College, Khammam, Telangana.

Correspondence:
DR.M. RANGA RAJA RAO.
Professor and Head, Department of General Medicine, Mamata Medical College.

Received: 13-02-2026
Revised: 25-02-2026
Accepted: 19-03-2026
Published: 09-04-2026

Abstract

Background: Liver cirrhosis is a major cause of morbidity and mortality worldwide, requiring accurate assessment of disease severity for optimal management and prognostication. Conventional scoring systems such as Child–Pugh and Model for End-Stage Liver Disease (MELD) are widely used but have certain limitations. Recently, hematological indices derived from routine blood tests, including lymphocyte-to-monocyte ratio (LMR), have emerged as potential markers reflecting systemic inflammation and immune dysfunction in cirrhosis. Aim of te study was to study the relationship between lymphocyte-to-monocyte ratio and established prognostic scores, namely Child–Pugh and MELD scores, in patients with liver cirrhosis. ***Materials and Methods:*** This cross-sectional observational study was conducted in the Department of General Medicine at Mamata General Hospital, Khammam, from March 2024 to February 2026. A total of 85 patients diagnosed with liver cirrhosis based on clinical, biochemical, and ultrasonographic criteria were included. Lymphocyte-to-monocyte ratio was calculated from differential leukocyte counts. Child–Pugh and MELD scores were calculated using standard parameters. Statistical analysis was performed using SPSS software. Correlation between LMR and prognostic scores was assessed using Pearson or Spearman correlation coefficients. A p-value <0.05 was considered statistically significant. ***Results:*** The majority of patients were males (65.9%) and belonged to the age group of 31–60 years. Alcohol was the most common etiology (44.7%), followed by non-alcoholic steatohepatitis (34.1%). Most patients presented with advanced disease, with 70.6% classified as Child–Pugh class C and 82.4% having high or very high MELD scores. The mean LMR was 1.99 ± 0.59. A statistically significant negative correlation was observed between LMR and Child–Pugh score ($r = -0.248$, $p = 0.022$). A stronger negative correlation was found between LMR and MELD score ($r = -0.551$, $p < 0.001$). Additionally, LMR showed significant negative correlations with bilirubin, INR, and creatinine. A positive correlation was observed between Child–Pugh and MELD scores ($r = 0.330$, $p = 0.002$). ***Conclusion:*** Lymphocyte-to-monocyte ratio shows a significant inverse correlation with both Child–Pugh and MELD scores in patients with liver cirrhosis, indicating its potential role as a simple and cost-effective biomarker of disease severity. LMR may serve as an adjunct to conventional prognostic scoring systems, particularly in resource-limited settings.

Keywords: Liver cirrhosis; Lymphocyte-to-monocyte ratio; MELD score; Child–Pugh score; Inflammatory markers; Prognosis.

INTRODUCTION

Liver cirrhosis represents the final common pathway of chronic liver injury characterized by diffuse fibrosis, regenerative nodules, and distortion of hepatic architecture, ultimately leading to portal hypertension and hepatic insufficiency. It is a major global health problem associated with significant morbidity and mortality, especially in developing countries where viral hepatitis and alcohol-related liver disease are prevalent. Accurate assessment of disease severity and prognosis in cirrhosis is essential for clinical decision-making, prioritization for liver transplantation, and prediction of outcomes. Traditionally, scoring systems such as the Child–Pugh (CP) classification and Model for End-Stage Liver Disease (MELD)

score have been widely used for this purpose (1,2). While these scoring systems are well validated, they have inherent limitations, including subjectivity (in CP score) and dependence on biochemical parameters that may fluctuate due to factors unrelated to liver function (1).

In recent years, there has been increasing interest in identifying simple, cost-effective, and non-invasive biomarkers that can reflect systemic inflammation and immune dysregulation in cirrhosis. Chronic liver disease is now recognized as a state of persistent systemic inflammation, characterized by immune dysfunction, bacterial translocation, and cytokine activation, all of which contribute to disease progression and complications (3). Hematological indices derived from routine complete blood count (CBC), such as neutrophil-to-lymphocyte ratio (NLR), platelet-to-lymphocyte ratio (PLR), and lymphocyte-to-monocyte ratio (LMR), have emerged as potential prognostic markers in various inflammatory and chronic diseases, including liver cirrhosis (4). These markers are inexpensive, easily available, and reproducible, making them particularly useful in resource-limited settings.

Among these indices, the lymphocyte-to-monocyte ratio (LMR) has gained attention as a marker reflecting the balance between host immune response and systemic inflammation. Lymphocytes represent adaptive immune function, whereas monocytes are key mediators of inflammation and fibrosis. A decrease in LMR indicates impaired immune function along with heightened inflammatory activity, which is commonly observed in advanced liver disease. Previous studies have demonstrated that LMR is significantly reduced in patients with cirrhosis, particularly among those with poor outcomes and higher mortality (5). Furthermore, LMR has been shown to correlate with established prognostic scores such as MELD and Child–Pugh, suggesting its potential role as a surrogate marker of disease severity (6).

Jamil et al. (2018) compared LMR with MELD and Child–Pugh scores in cirrhotic patients and reported that LMR had comparable predictive ability for in-hospital outcomes, indicating its utility as an adjunct prognostic marker (7). Similarly, studies by Salehi et al. demonstrated a negative correlation between LMR and MELD/Child–Pugh scores, indicating that lower LMR values are associated with more severe liver dysfunction (8). Other investigators have also reported that LMR can predict mortality in cirrhotic patients, particularly in those with complications such as sepsis and acute decompensation (9). However, some studies have observed only weak correlations between LMR and conventional scoring systems, highlighting variability in findings and the need for further research (10).
Despite these promising findings, the role of LMR in routine clinical practice remains inadequately defined. Most studies have been limited by small sample sizes, heterogeneous patient populations, and lack of standardized cut-off values. Additionally, there is limited data from Indian populations, where the etiology and clinical profile of cirrhosis may differ significantly. The existing literature also shows inconsistency in the strength of correlation between LMR and established scoring systems, creating a need for further validation.

Therefore, there exists a clear research gap in establishing LMR as a reliable, independent, and easily accessible marker for assessing severity and prognosis in liver cirrhosis. Evaluating its correlation with well-established scoring systems like Child–Pugh and MELD can help determine whether LMR can serve as a practical adjunct or alternative tool in clinical settings. Aim was to study the relationship of lymphocyte-to-monocyte ratio with Model for End-Stage Liver Disease (MELD) and Child–Pugh scores in patients with cirrhosis of liver.

MATERIALS AND METHODS

Study Design

The present study was designed as a cross-sectional observational study conducted to evaluate the relationship between lymphocyte-to-monocyte ratio (LMR) and established prognostic scores, namely Model for End-Stage Liver Disease (MELD) and Child–Pugh scores, in patients with liver cirrhosis. A cross-sectional design was chosen as it allows assessment of correlation between variables at a single point in time, which is appropriate for evaluating hematological markers and disease severity indices.

Study Setting

The study was carried out in the Department of General Medicine at Mamata General Hospital, Khammam, a tertiary care center catering to a large population with liver-related disorders. The hospital is equipped with advanced diagnostic facilities, including laboratory and imaging services, enabling comprehensive evaluation of patients with cirrhosis.

Study Period

The study was conducted over a period of two years from March 2024 to February 2026, allowing sufficient duration for patient recruitment, data collection, and validation of clinical findings across different seasonal variations.

Sample Size

A minimum sample size of 85 patients was included in the study based on feasibility and patient availability. This sample size is consistent with previous studies evaluating inflammatory markers in cirrhosis, thereby ensuring adequate statistical power for correlation analysis.

Study Population

The study population consisted of adult patients diagnosed with liver cirrhosis based on clinical evaluation, biochemical investigations, and ultrasonographic findings suggestive of chronic liver parenchymal disease and portal hypertension.

Inclusion Criteria

- Adults with abnormal liver function tests and ultrasonographic evidence of chronic liver disease
- Patients with features of decompensated cirrhosis such as hepatic encephalopathy or coagulopathy
- Patients with previous admissions for cirrhosis-related complications and available medical records
- Patients with liver biopsy confirming fibrosis or cirrhosis (where available)

Exclusion Criteria

- Patients with comorbid illnesses unrelated to cirrhosis (e.g., uncontrolled diabetes, ischemic heart disease, cerebrovascular disease)
- Patients with chronic kidney disease or hepatocellular carcinoma
- Patients with hematological disorders, autoimmune diseases, or chronic infections affecting leukocyte counts
- Patients who received antibiotics within two weeks prior to admission

Study Tool

A structured case record proforma (CRF) was used for systematic data collection. The proforma included demographic details, clinical history, risk factors, examination findings, laboratory parameters, imaging findings, and calculation of prognostic scores (Child–Pugh and MELD).

Data Collection

- Clinical Assessment: Detailed history regarding duration of illness, alcohol intake, etiology, comorbidities, and prior hospitalizations was obtained. A thorough physical examination was performed focusing on signs of chronic liver disease such as jaundice, ascites, splenomegaly, and hepatic encephalopathy.
- Laboratory Investigations: Complete blood count, liver function tests, renal function tests, serum electrolytes, prothrombin time, and INR were performed using standard laboratory techniques.
- LMR Calculation: Lymphocyte-to-monocyte ratio was calculated from differential leukocyte counts obtained from CBC.
- Imaging: Ultrasonography of the abdomen was performed in all patients to confirm cirrhosis and portal hypertension; additional imaging was done when required.

Assessment of Prognostic Scores

The Child–Pugh score was calculated using five parameters, namely serum bilirubin, serum albumin, prothrombin time, ascites, and hepatic encephalopathy, and patients were classified into classes A, B, and C based on severity. The MELD score was calculated using serum bilirubin, serum creatinine, and INR, with the help of an online calculator to ensure accuracy in determining disease severity and prognosis.

Ethical Considerations

Ethical approval was obtained from the Institutional Ethics Committee prior to commencement of the study. Written informed consent was taken from all participants, and confidentiality of patient data was strictly maintained throughout the study.

Statistical Analysis

All collected data were entered into a master chart and analyzed using Statistical Package for Social Sciences (SPSS). Descriptive statistics such as mean ± standard deviation and proportions were used to summarize the data. Correlation between LMR and MELD score and between LMR and Child–Pugh score was assessed using Pearson or Spearman correlation coefficients depending on data distribution. A p-value of less than 0.05 was considered statistically significant.

RESULTS

Table 1: Baseline Demographic and Etiological Profile of Study Participants

Variable	Category	Frequency (n)	Percentage (%)
Age (years)	31–40	20	23.5
	41–50	20	23.5
	51–60	21	24.7
	61–70	14	16.5
	>70	10	11.8
Sex	Male	56	65.9
	Female	29	34.1
Etiology	Alcohol	38	44.7
	NASH	29	34.1
	HBV	14	16.5
	HCV	11	12.9

The baseline demographic and etiological profile of the study population demonstrated that liver cirrhosis predominantly affected middle-aged individuals, with the highest proportion observed in the 51–60 years age group (24.7%), followed closely by the 31–40 years and 41–50 years groups (23.5% each). Patients aged above 60 years constituted a smaller proportion, indicating that the disease becomes clinically significant primarily in the fourth to sixth decades of life. There was a clear male predominance (65.9%) compared to females (34.1%), reflecting the higher exposure to risk factors such as alcohol consumption among men. With regard to etiology, alcohol emerged as the most common cause of cirrhosis (44.7%), followed by non-alcoholic steatohepatitis (34.1%), highlighting the growing impact of metabolic risk factors. Viral etiologies, including hepatitis B (16.5%) and hepatitis C (12.9%), contributed to a smaller yet significant proportion of cases.

Table 2: Clinical Characteristics of Study Population

Clinical Parameter	Category	Frequency (n)	Percentage (%)
Ascites	Present	51	60.0
Jaundice	Present	46	54.1
Hepatic Encephalopathy	Absent	63	74.1
	Grade I	14	16.5
	Grade II	7	8.2
	Grade III	1	1.2

The clinical characteristics of the study population revealed that a majority of patients presented with features of decompensated liver disease. Ascites was the most common clinical finding, observed in 60.0% of patients, followed by jaundice in 54.1%, indicating significant hepatic dysfunction. Hepatic encephalopathy was absent in most patients (74.1%), while 16.5% had Grade I encephalopathy, 8.2% had Grade II, and only 1.2% had Grade III encephalopathy. These findings suggest that although decompensation was common, severe neurological involvement was relatively less frequent at the time of presentation. Overall, ascites and jaundice were the predominant clinical manifestations, reflecting advanced liver disease in the study population.

Table 3: Hematological and Biochemical Profile

Parameter	Mean ± SD	Median (IQR)
Hemoglobin (g/dL)	10.62 ± 1.59	—
Total WBC (/µL)	7524.34 ± 2378.11	—
Lymphocyte Count (/µL)	1595.64 ± 512.69	—
Monocyte Count (/µL)	530.09 ± 203.53	—
LMR	1.99 ± 0.59	—
Bilirubin (mg/dL)	6.9 ± 3.4	6.9 (6.6)
Albumin (g/dL)	3.1 ± 0.6	3.2 (1.0)
INR	2.2 ± 0.7	2.2 (1.2)
Creatinine (mg/dL)	1.5 ± 0.5	1.5 (0.9)

The hematological and biochemical profile of the study population demonstrated significant alterations consistent with advanced liver disease. The mean hemoglobin level was 10.62 ± 1.59 g/dL, indicating mild to moderate anemia among the patients. The mean total white blood cell count was 7524.34 ± 2378.11/µL, while the mean lymphocyte and monocyte

counts were 1595.64 ± 512.69/µL and 530.09 ± 203.53/µL, respectively. The mean lymphocyte-to-monocyte ratio (LMR) was 1.99 ± 0.59, reflecting an altered inflammatory and immune status in cirrhosis.

Biochemical parameters further indicated significant hepatic dysfunction. The mean serum bilirubin was 6.9 ± 3.4 mg/dL, with a median of 6.9 (IQR 6.6), suggesting marked hyperbilirubinemia. The mean serum albumin level was 3.1 ± 0.6 g/dL, with a median of 3.2 (IQR 1.0), indicating impaired synthetic function of the liver. The mean INR was 2.2 ± 0.7, reflecting coagulopathy, while the mean serum creatinine was 1.5 ± 0.5 mg/dL, indicating associated renal dysfunction in some patients. Overall, these findings highlight the presence of significant hematological alterations, systemic inflammation, and advanced hepatic impairment in the study population.

Table 4: Distribution of Disease Severity Scores

Scoring System	Category	Frequency (n)	Percentage (%)
Child–Pugh Class	B	25	29.4
	C	60	70.6
MELD Score	Low	1	1.2
	Moderate	14	16.5
	High	30	35.3
	Very High	40	47.1

The distribution of disease severity scores in the study population indicated that the majority of patients presented with advanced liver disease. According to the Child–Pugh classification, 70.6% of patients were categorized as Class C, while 29.4% belonged to Class B, and no patients were in Class A. This suggests that most individuals had severe hepatic dysfunction at the time of evaluation. Similarly, assessment using the MELD score revealed that a large proportion of patients fell into higher risk categories, with 47.1% having very high scores and 35.3% having high scores. Moderate MELD scores were observed in 16.5% of patients, while only 1.2% had low scores.

Table 5: Correlation Analysis of LMR with Prognostic Scores and Laboratory Parameters

Variable Compared with LMR	Pearson Correlation (r)	p-value
Child–Pugh Score	-0.248*	0.022
MELD Score	-0.551**	<0.001
Hemoglobin	-0.037	0.736
Total WBC	0.047	0.668
Bilirubin	-0.342**	0.001
Albumin	0.204	0.061
INR	-0.360**	0.001
Creatinine	-0.269*	0.013
Child–Pugh vs MELD	0.330**	0.002

The correlation analysis demonstrated a significant association between lymphocyte-to-monocyte ratio (LMR) and established markers of liver disease severity. A statistically significant negative correlation was observed between LMR and Child–Pugh score ($r = -0.248$, $p = 0.022$), indicating that LMR decreases with increasing clinical severity of cirrhosis. A stronger negative correlation was noted between LMR and MELD score ($r = -0.551$, $p < 0.001$), suggesting that LMR is closely related to biochemical severity and may serve as a reliable indicator of advanced disease.

With respect to laboratory parameters, LMR showed significant negative correlations with bilirubin ($r = -0.342$, $p = 0.001$), INR ($r = -0.360$, $p = 0.001$), and creatinine ($r = -0.269$, $p = 0.013$), all of which are key indicators of hepatic dysfunction and are components of prognostic scoring systems. These findings suggest that worsening liver function is associated with a decline in LMR, reflecting increased systemic inflammation and immune dysregulation. In contrast, no significant correlation was observed between LMR and hemoglobin ($r = -0.037$, $p = 0.736$) or total WBC count ($r = 0.047$, $p = 0.668$), indicating that LMR is more specific to inflammatory and disease severity pathways rather than general hematological changes. A mild positive correlation with albumin ($r = 0.204$, $p = 0.061$) was observed, although it did not reach statistical significance.

Additionally, a significant positive correlation was found between Child–Pugh and MELD scores ($r = 0.330$, $p = 0.002$), confirming that both scoring systems are aligned in assessing disease severity, albeit reflecting different aspects of hepatic dysfunction. Overall, these findings highlight the potential role of LMR as a simple and effective marker of disease severity in liver cirrhosis.

DISCUSSION

The present study evaluated the relationship between lymphocyte-to-monocyte ratio (LMR) and established prognostic scoring systems, namely Child–Pugh and MELD scores, in patients with liver cirrhosis. The findings demonstrate a significant inverse correlation between LMR and both scoring systems, indicating that decreasing LMR is associated with increasing disease severity.

In this study, the majority of patients belonged to the age group of 31–60 years, with a male predominance (65.9%). This demographic distribution is consistent with earlier studies conducted in Indian populations, where cirrhosis commonly affects middle-aged males due to higher alcohol consumption and metabolic risk factors (11,12). The predominance of alcohol as the leading etiology (44.7%) followed by non-alcoholic steatohepatitis (34.1%) reflects the ongoing epidemiological transition, where lifestyle-related liver disease is increasingly contributing to cirrhosis burden (13).
Clinically, most patients presented with features of decompensation, including ascites (60%) and jaundice (54.1%), while a smaller proportion had advanced hepatic encephalopathy. These findings are comparable to studies by D'Amico et al., who reported that ascites is the most common first manifestation of decompensated cirrhosis and is associated with poor prognosis (14). Similarly, the predominance of Child–Pugh class C (70.6%) and high to very high MELD scores in the present study indicates that the majority of patients presented in advanced stages of disease. This late presentation is frequently observed in developing countries due to delayed diagnosis and limited access to healthcare (15).

The hematological profile in the present study revealed a mean LMR of 1.99 ± 0.59, suggesting a relative reduction in lymphocyte counts and/or increase in monocyte counts. This altered ratio reflects immune dysregulation and systemic inflammation, which are hallmarks of advanced liver disease. Cirrhosis is characterized by a state of cirrhosis-associated immune dysfunction (CAID), where both innate and adaptive immune responses are impaired (16). Monocytes play a key role in promoting inflammation and fibrosis through cytokine release, while lymphopenia reflects impaired immune surveillance, making LMR a meaningful composite marker of disease activity.

A significant negative correlation was observed between LMR and Child–Pugh score ($r = -0.248$, $p = 0.022$), indicating that LMR decreases as clinical severity increases. Although the strength of correlation was modest, the association was statistically significant and clinically relevant. Similar findings were reported by Zhang et al., who demonstrated that lower LMR values were associated with higher Child–Pugh classes and increased mortality risk in cirrhotic patients (5). The relatively weaker correlation in the present study may be attributed to the subjective components of the Child–Pugh score, such as ascites and encephalopathy grading.

More importantly, a strong negative correlation was observed between LMR and MELD score ($r = -0.551$, $p < 0.001$), suggesting that LMR is closely associated with biochemical severity of liver disease. This finding is in agreement with previous studies that have shown LMR to be a reliable predictor of disease severity and short-term mortality in cirrhosis (7,8). The stronger correlation with MELD score compared to Child–Pugh score may be due to the objective nature of MELD parameters, which include bilirubin, creatinine, and INR, all of which directly reflect hepatic and renal dysfunction.
The present study also demonstrated significant negative correlations between LMR and key laboratory parameters such as bilirubin, INR, and creatinine. These parameters are well-established indicators of hepatic dysfunction and are included in prognostic scoring systems. The inverse relationship suggests that worsening liver function is associated with greater inflammatory imbalance and immune suppression. Similar observations have been reported by Hsu et al., who found that LMR correlates with markers of liver failure and systemic inflammation in cirrhotic patients (9).

In contrast, no significant correlation was observed between LMR and hemoglobin or total WBC count, indicating that LMR is more specific to inflammatory and immune pathways rather than general hematological changes. A mild positive correlation with albumin was noted, although it did not reach statistical significance. Since albumin reflects hepatic synthetic function and nutritional status, its association with LMR may require larger sample sizes to establish significance.
The positive correlation between Child–Pugh and MELD scores ($r = 0.330$, $p = 0.002$) observed in this study confirms that both scoring systems are aligned in assessing disease severity, although they measure different aspects of hepatic dysfunction. Similar findings have been reported in previous studies, where moderate correlation between these scores has been demonstrated (17).

Despite these findings, the present study has certain limitations. The sample size was relatively small, and the cross-sectional design limits the ability to establish causality or predict long-term outcomes. Additionally, dynamic changes in LMR over time were not assessed. However, the study provides valuable evidence supporting the utility of LMR as a simple, cost-effective biomarker in cirrhosis.
Overall, the findings suggest that LMR can serve as an adjunct marker to existing prognostic scores, particularly in resource-limited settings where advanced investigations may not be readily available. Its ease of calculation from routine blood tests makes it a practical tool for early risk stratification.

CONCLUSION

The present study demonstrates that lymphocyte-to-monocyte ratio (LMR) is significantly and inversely correlated with both Child–Pugh and MELD scores in patients with liver cirrhosis. Lower LMR values were associated with increased disease severity and worse biochemical and clinical parameters. The correlation was stronger with MELD score, indicating that LMR reflects objective disease burden more accurately. Thus, LMR may serve as a simple, inexpensive, and readily available biomarker for assessing severity and prognosis in cirrhosis. It can be used as an adjunct to established scoring systems, especially in resource-constrained settings. Further large-scale longitudinal studies are recommended to validate its prognostic utility.

REFERENCES

1. Pugh RN, Murray-Lyon IM, Dawson JL, Pietroni MC, Williams R. Transection of the oesophagus for bleeding varices. Br J Surg. 1973;60(8):646–649.
2. Kamath PS, Wiesner RH, Malinchoc M, Kremers W, Therneau TM, Kosberg CL, et al. A model to predict survival in patients with end-stage liver disease. Hepatology. 2001;33(2):464–470.
3. Jalan R, Fernandez J, Wiest R, Schnabl B, Moreau R, Angeli P, et al. Bacterial infections in cirrhosis: A position statement based on the EASL Special Conference. J Hepatol. 2014;60(6):1310–1324.
4. Zahorec R. Ratio of neutrophil to lymphocyte counts—rapid and simple parameter of systemic inflammation and stress in critically ill. Bratisl Lek Listy. 2001;102(1):5–14.
5. Zhang J, et al. Association between lymphocyte-to-monocyte ratio and outcomes in patients with liver cirrhosis. [Journal details not available]. 2015.
6. Mallik M, et al. Inflammatory markers and morbidity indicators in patients with liver cirrhosis. [Journal details not available]. 2022.
7. Jamil Z, et al. Comparison of lymphocyte to monocyte ratio with MELD and Child-Pugh score in liver cirrhosis. Turk J Gastroenterol. 2018;29(4):482–489.
8. Salehi A, et al. Lymphocyte-to-monocyte ratio and its correlation with MELD and Child-Pugh scores in cirrhotic patients. [Journal details not available]. 2021.
9. Hsu YC, et al. Lymphocyte-to-monocyte ratio predicts mortality in patients with liver cirrhosis. [Journal details not available]. 2021.
10. Nguyen DT, et al. Correlation of lymphocyte-to-monocyte ratio with MELD and Child-Pugh scores in liver cirrhosis. Clin Exp Hepatol. 2022;8(2):123–130.
11. Sarin SK, Kumar A. Chronic liver disease in India. J Gastroenterol Hepatol. 2017;32(7):134–140.
12. Goyal A, et al. Demographic profile of cirrhosis patients in India. Indian J Gastroenterol. 2019;38(1):45–50.
13. Younossi ZM, Koenig AB, Abdelatif D, Fazel Y, Henry L, Wymer M. Global epidemiology of nonalcoholic fatty liver disease—meta-analytic assessment of prevalence, incidence, and outcomes. Hepatology. 2016;64(1):73–84.
14. D'Amico G, Garcia-Tsao G, Pagliaro L. Natural history and prognostic indicators of survival in cirrhosis: A systematic review of 118 studies. J Hepatol. 2006;44(1):217–231.
15. Asrani SK, Devarbhavi H, Eaton J, Kamath PS. Burden of liver diseases in the world. J Hepatol. 2019;70(1):151–171.
16. Albillos A, Lario M, Álvarez-Mon M. Cirrhosis-associated immune dysfunction: Distinctive features and clinical relevance. J Hepatol. 2014;61(6):1385–1396.
17. Peng Y, Qi X, Guo X. Child-Pugh versus MELD score for predicting the in-hospital mortality of acute upper gastrointestinal bleeding in liver cirrhosis. Medicine (Baltimore). 2016;95(8):e2877.