American Journal of Psychiatric Rehabilitation | Expert Opinion Article

Frequency,Severity,and Clinical Correlates of Thrombocytopenia in Patients with Liver Cirrhosis: A Descriptive Cross-Sectional Study

Dr. Waheed Abid[1*], Dr. Bakht Ali[2], Dr. Khalida Parveen[3], Dr. Hafiza Amina Jahangir[4], Dr. Zeeshan Ahmed[5], Dr. Abrar Ali Shaikh[6]

[1*]Pir Abdul Qadir Shah Jeelani Institute of Medical Sciences, Gambat; Designation: Postgraduate Trainee FCPS Medicine; Qualification: MBBS; Email ID: waheedabid0303@gmail.com
[2]Pir Abdul Qadir Shah Jeelani Institute of Medical Sciences, Gambat; Designation: Assistant Professor; Qualification: MBBS, FCPS; Email ID: bakhtsiyal2014@gmail.com
[3]Pir Abdul Qadir Shah Jeelani Institute of Medical Sciences, Gambat; Designation: Senior Registrar; Qualification: MBBS, MD; Email ID: dr.khalida.32@gmail.com
[4]Pir Abdul Qadir Shah Jeelani Institute of Medical Sciences, Gambat; Designation: Postgraduate Trainee FCPS Medicine; Qualification: MBBS; Email ID: amnaj4705@gmail.com
[5]Pir Abdul Qadir Shah Jeelani Institute of Medical Sciences, Gambat; Designation: Postgraduate Trainee FCPS Medicine; Qualification: MBBS; Email ID: drzeeshanghuman@gmail.com
[6]Pir Abdul Qadir Shah Jeelani Institute of Medical Sciences, Gambat; Designation: Professor; Qualification: MBBS, MRCP; Email ID: abrarshaikh2002@gmail.com

Submission Date: 30/10/2025, Revised Dates: 16/11/2025, Accepted Date: 27/11/2025 Publication Date: 11/12/2025

Abstract

Objective: To determine the frequency, severity, and clinical correlates of thrombocytopenia among patients diagnosed with liver cirrhosis.

Methodology: This descriptive cross-sectional study was carried out at GIMS Gambat during the period of January to June 2025. The study used non-probability (consecutive sampling) to enroll a total of 247 patients with confirmed liver cirrhosis. Platelet count was assessed for the detection of thrombocytopenia and categorisation into mild, moderate and severe. The data was entered and analysed with SPSS 26. Association between thrombocytopenia and clinical variables was evaluated using the chi-square test with $p < 0.05$ being considered significant.

Results: A total of 247 patients who had liver cirrhosis were included. The mean age was 40.46 ± 12.29 years, and the mean duration of cirrhosis was 31.86 ± 17.96 months. The male population was 55.1% and female population was 44.9% of the study population. 36.8% of the subjects had thrombocytopenia. Mild thrombocytopenia was reported in 57 patients, moderate thrombocytopenia in 119 patients and severe thrombocytopenia in 71 patients with regard to the severity pattern. The mean age of the patients with thrombocytopenia was significantly less than those without thrombocytopenia (31.07 ± 11.71 years and 45.94 ± 8.84 years, respectively; $p = 0.0001$). There was also a statistically significant correlation between Child-Pugh class and thrombocytopenia ($p = 0.0001$).

Conclusion: Thrombocytopenia was a common and clinically significant haematological abnormality in patients with liver cirrhosis. It is associated with age, Child-Pugh class, suggesting that platelet count could be supportive in clinical evaluation.

Keywords: Platelet Count, Thrombocytopenia, Child-Pugh Classification, Haematological Abnormalities, Liver Cirrhosis, Portal Hypertension

Introduction

Liver cirrhosis is the end stage, irreversible and progressive, of liver disease which is characterised by diffuse hepatic fibrosis, regenerative nodules, distortion of the normal liver structure and progressive loss of liver function. It continues to be a major public health problem globally due to the fact that it is associated with high morbidity and mortality as well as repeated hospital admissions, portal hypertension, ascites, variceal bleeding, haematological abnormalities and hepatic encephalopathy [1]. Liver cirrhosis is principally caused by chronic viral hepatitis, alcoholic liver disease and non-alcoholic fatty liver disease [2]. Chronic liver disease still remains a significant clinical burden in Pakistan because of high prevalence of Hepatitis B and C and late presentation of patients to the tertiary care hospitals.

Thrombocytopenia is one of the common haematological disorders seen in liver cirrhosis. It is generally defined as a platelet count below 150,000/μL and can be segmented into mild, moderate

and severe based on the platelet count [3]. Thrombocytopenia is not just a laboratory finding in liver cirrhosis, but also a highly relevant parameter for clinical assessment, for determining bleeding risk, for planning invasive procedures and for monitoring the disease.

Thrombocytopenia in cirrhosis is a multifactorial disease. A central role of reduced hepatic production of thrombopoietin is played, which is mainly produced by the liver and it is necessary for platelet production. In addition, portal hypertension leads to splenomegaly and hypersplenism, causing increased sequestration and destruction of platelets in the spleen [4,5]. Other mechanisms of action involve bone marrow suppression, immune-mediated platelet destruction, chronic viral infection, bone marrow toxicity caused by alcohol, systemic inflammation, and nutritional deficiencies. These mechanisms may be different in patients depending on the severity, duration and aetiology of liver disease.

Thrombocytopenia is clinically relevant particularly when patients with cirrhosis need diagnostic or therapeutic procedures. Before endoscopy, liver biopsy, paracentesis, central venous catheterisation and surgery, consideration should be given to the platelet count. Hypothyroidism may cause severe thrombocytopenia, which can be a cause for concern for bleeding problems and may impact the use of platelet transfusion and/or pharmacological treatment. Thus, an assessment of the incidence and incidence rate of thrombocytopenia in cirrhotic patients is of real value in clinical practice.

Some studies have shown varying incidence of thrombocytopenia in patients with chronic liver disease and cirrhosis. In a study by Mehmood et al., 36.3% of the patients with chronic liver disease were found to have thrombocytopenia when they presented to a tertiary care hospital [7]. Thrombocytopenia was also noted to be common in patients with chronic liver disease as observed by Abbas et al [8]. The discrepancies in the frequency reported may be attributed to differences in the setting of the studies, size of the populations, severity of the disease, aetiology of cirrhosis and diagnostic criteria.

Although the frequency of thrombocytopenia has been studied previously, evaluating its clinical correlates remains important. Age, gender, length of cirrhosis and Child-Pugh class may be useful in determining who is more likely to develop thrombocytopenia. The Child-Pugh class is especially relevant as it is a measure of the functional reserve of the liver and the severity of the disease. The assessment of the relationship between thrombocytopenia and Child-Pugh class may help to determine that if platelet count have supportive value in evaluation of clinical status of cirrhotic patients.

Hence, the present descriptive cross-sectional study was conducted to find out the prevalence, severity and clinical association of Thrombocytopenia among liver cirrhosis patients in GIMS, Gambat. Specifically, the relationship of thrombocytopenia to age, sex, duration of cirrhosis and Child-Pugh class was evaluated.

Methodology

It was a descriptive cross-sectional study done in Medical Units- I, II and III and General Medicine Out Patient Department of GIMS, Gambat. The study was carried out from January 2025 to June 2025. Non-probability consecutive sampling technique was used in which 247 patients with confirmed liver cirrhosis were included.

Liver cirrhosis was diagnosed using clinical, biochemical and ultrasonographic criteria. Clinical signs indicative of cirrhosis were ascites, clubbing, palmar erythema, and other signs of chronic liver disease. Biochemical evidence included elevated bilirubin (> 1.5 mg/dL), decreased albumin (< 3.5 g/dL) or elevated INR (> 1.2) or elevated AST (> ALT). The ultrasound characteristics that suggested cirrhosis were nodular or atrophic liver, coarse liver echotexture and irregular liver margins.

Patients with liver cirrhosis of 6 months or more and with Child-Pugh class A, B or C were included. Patients with a known haematological disorder like immune thrombocytopenia, leukaemia or myelodysynthetic syndrome were excluded. Patients who had a history of bone marrow disease, splenectomy, liver transplantation, active malignancy, recent chemotherapy or radiotherapy, acute liver failure, chronic renal failure requiring dialysis, pregnancy, lactation, or platelet transfusion within four weeks were also excluded.

Thrombocytopenia was considered as less than 150,000/μL platelets. Thrombocytopenia was classified as moderate (platelet count 50,000 to 99,999/μL), severe (platelet count < 50,000/μL), and mild (platelet count 100,000 to 149,999/μL). Platelet count was determined by platelet count using Sysmex-1000 haematology analyser.

Data on demographic and clinical characteristics were gathered on a pre-designed proforma after receiving written informed consent. The following variables were recorded: age, gender, duration of cirrhosis, Child-Pugh class, platelet count, presence or absence of thrombocytopenia and degree of thrombocytopenia. Throughout the study patient information was kept confidential.

The data were analysed with SPSS software 26. The quantitative variables, such as age and duration of cirrhosis, were expressed as mean and standard deviation. Qualitative variables (gender, Child-Pugh class, thrombocytopenia status and severity of thrombocytopenia) were described as frequencies and percentages. The association between thrombocytopenia and clinical variables was determined by chi-square test. A p-value of less than 0.05 was considered statistically significant.

Results

A total of 247 patients with liver cirrhosis were included in the study. The mean age of the study population was 40.46 ± 12.29 years, with a 95% confidence interval of 38.92–42.00 years. The mean duration of cirrhosis was 31.86 ± 17.96 months, with a 95% confidence interval of 29.61–34.11 months.

Out of 247 patients, 136 were male and 111 were female. Males represented 55.1% of the study population, while females represented 44.9%. Regarding liver disease severity, 67 patients were classified as Child-Pugh class A, 104 patients as Child-Pugh class B, and 76 patients as Child-Pugh class C. Thus, Child-Pugh class B was the most frequent category in the study population.

Table I: Baseline Demographic and Clinical Characteristics of Patients

Variable	Value
Age, mean ± SD	40.46 ± 12.29 years
95% CI for age	38.92–42.00
Duration of cirrhosis, mean ± SD	31.86 ± 17.96 months
95% CI for duration	29.61–34.11
Male	136 (55.1%)
Female	111 (44.9%)
Child-Pugh class A	67 (27.1%)
Child-Pugh class B	104 (42.1%)
Child-Pugh class C	76 (30.8%)

Thrombocytopenia was present in 36.8% of patients. The severity distribution showed that mild thrombocytopenia was present in 57 patients, moderate thrombocytopenia in 119 patients, and severe thrombocytopenia in 71 patients. Moderate thrombocytopenia was the most commonly observed severity category.

Table II: Severity Distribution of Thrombocytopenia

Severity	N (%)
Mild	57 (23.1%)
Moderate	119 (48.4%)
Severe	71 (28.6%)

Comparison between patients with and without thrombocytopenia showed significant differences in age. Patients with thrombocytopenia had a mean age of 31.07 ± 11.71 years, while patients without thrombocytopenia had a mean age of 45.94 ± 8.84 years. This difference was statistically significant ($p = 0.0001$).

The mean duration of liver cirrhosis was 30.67 ± 18.15 months among patients with thrombocytopenia and 32.55 ± 17.86 months among patients without thrombocytopenia. This difference was not statistically significant ($p = 0.428$).

Regarding gender distribution, males accounted for 62.6% of patients with thrombocytopenia and 52.3% of patients without thrombocytopenia. Females accounted for 37.4% of patients with thrombocytopenia and 47.7% of patients without thrombocytopenia. The association between gender and thrombocytopenia was not statistically significant ($p = 0.068$).

A statistically significant association was observed between thrombocytopenia and Child-Pugh class (p = 0.0001). Among patients with thrombocytopenia, 58.2% were in Child-Pugh class A, 33.0% were in class B, and 8.8% were in class C. Among patients without thrombocytopenia, 9.0% were in class A, 47.4% were in class B, and 43.6% were in class C.

Table III: Clinical Correlates of Thrombocytopenia

Variable	Thrombocytopenia Present	Thrombocytopenia Absent	P-value
Age, mean ± SD	31.07 ± 11.71	45.94 ± 8.84	0.0001
Duration of cirrhosis, mean ± SD	30.67 ± 18.15	32.55 ± 17.86	0.428
Male	62.6%	52.3%	0.068
Female	37.4%	47.7%	—
Child-Pugh class A	58.2%	9.0%	0.0001
Child-Pugh class B	33.0%	47.4%	—
Child-Pugh class C	8.8%	43.6%	—

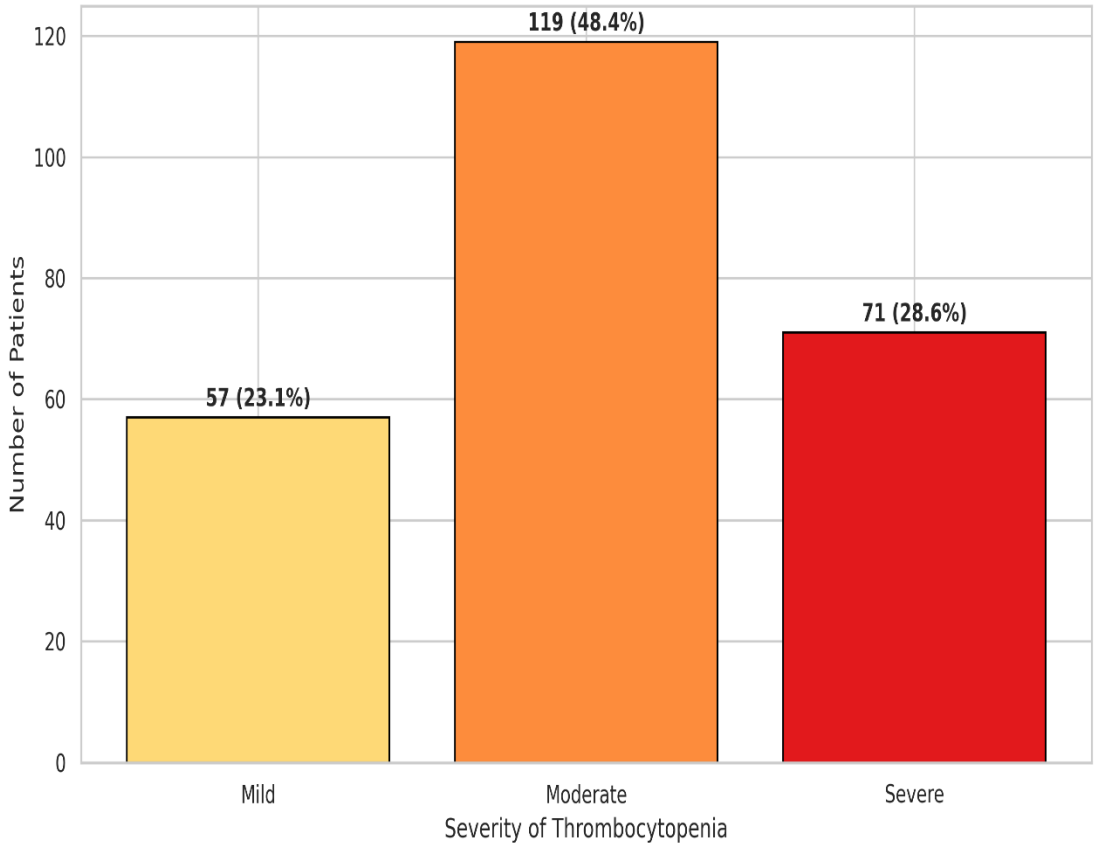

Figure 1: Distribution Of Thrombocytopenia Severity

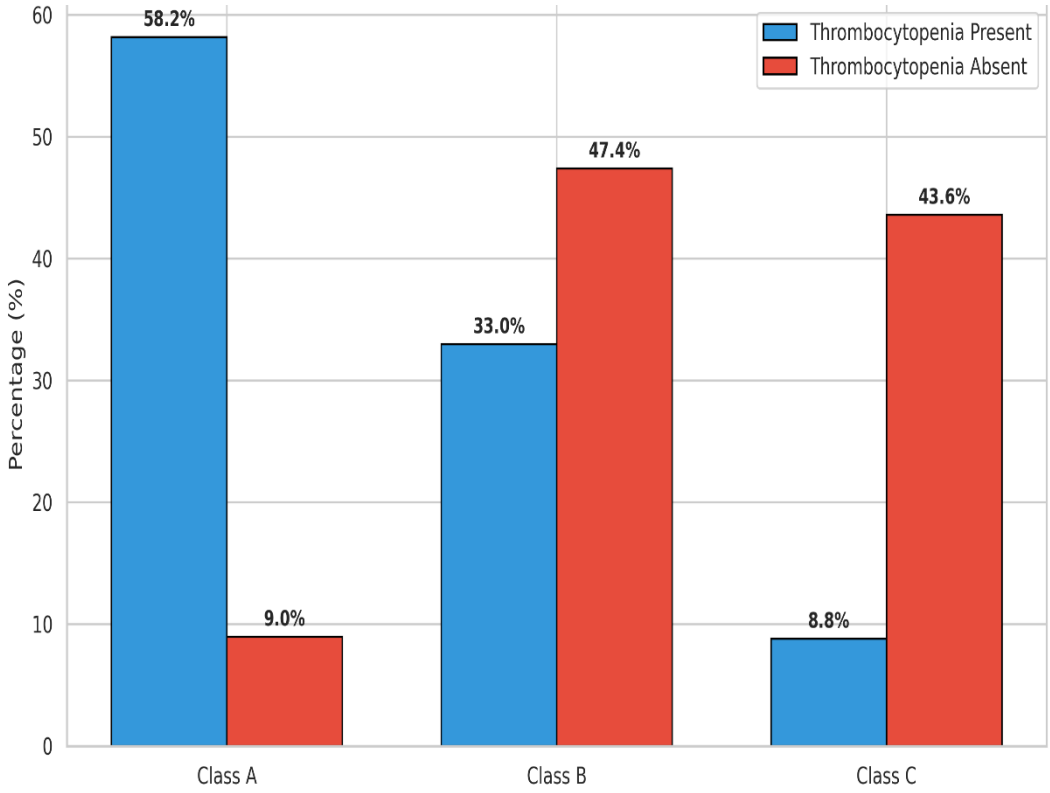

Figure 2: Child-Pugh Class Distribution by Thrombocytopenia Status

Discussion

The present descriptive cross-sectional study aimed to assess the prevalence, severity and clinical association of thrombocytopenia in patients with liver cirrhosis. Thrombocytopenia was found in a significant number of patients with cirrhosis, thus supporting the platelet reduction as one of the important haematological abnormalities in chronic liver disease. This is clinically important as thrombocytopenia is not only a laboratory abnormality but also a convenient parameter used for clinical evaluation, follow up and pre-procedural management. Thrombocytopenia is among the most frequent sequel of severe liver disease and has a close association with the abnormal haemostatic profile found in cirrhosis, as reported by Scharf [11]. In the present study, the incidence of thrombocytopenia was 36.8%. This finding is in keeping with the current knowledge of the high prevalence of thrombocytopenia in cirrhotic patients, which could be variable from one study to another due to differences in patient selection, study design, diagnostic thresholds and disease severity. Thrombocytopenia in chronic liver disease was considered a multifactorial phenomenon, increasing in prevalence from compensated to decompensated cirrhosis stages, by Gallo et al. [12].

As far as severity, moderate thrombocytopenia was the most frequent, severe and mild thrombocytopenia were the next frequent and mild was least frequent in the present study. The clinical implications of this severity distribution are that moderate or severe thrombocytopenia may warrant more careful clinical assessments, especially prior to invasive procedures. More recent reviews on haematological abnormalities in liver cirrhosis also point out thrombocytopenia as one of the most prominent cytopenias observed in cirrhosis, related to portal hypertension, hypersplenism, decreased hepatic synthetic function, chronic hepatitis, nutritional deficiency, and marrow suppression from drugs [13]. The mechanism of thrombocytopenia in cirrhosis is complex. The diseased liver has a decreased production of thrombopoietin resulting in a decrease in platelet production, and the portal hypertension leads to splenic enlargement and platelet sequestration. Other factors include immune mediated platelet destruction, bone marrow suppression, alcohol related bone marrow toxicity, viral hepatitis and systemic inflammation. [14].

There was a significant association between age and thrombocytopenia in this study. The patients with thrombocytopenia had a lower age than the patients without thrombocytopenia. The reason for this finding could be due to different disease aetiology or clinical presentation, referral pattern or biological behaviour of the younger group of cirrhotic patients. This association should be interpreted as non-causal, however, as this was a cross-sectional study. The AGA guideline also recommends that other abnormalities in coagulation in cirrhosis be interpreted with caution and individualisation as routine coagulation parameters alone may not fully predict clinical

outcomes [15]. In the current study, there was no significant relationship between gender and thrombocytopenia. Males were more common in the thrombocytopenic group, but without statistical significance. Likewise, there was no significant association between the duration of cirrhosis and thrombocytopenia. The ISTH guidance also clarifies that the reduction in platelets, and the prolongation of coagulation parameters, cannot be considered alone as representative of the overall haemostatic balance in patients with cirrhosis, thus underlining the importance of interpretation in a clinical context [16].

Thrombocytopenia was found to be statistically significant associated with Child-Pugh class. This finding suggests that platelet count might be associated with the functional status of the liver and might serve as supportive data during clinical evaluation. But this association should be cautiously interpreted and confirmed with the raw data before the final submission as the thrombocytopenia is expected to increase as hepatic dysfunction and portal hypertension worsens. [17]. The significance of thrombocytopenia is clearer when the patient with cirrhosis needs invasive procedures. Low platelet counts may require endoscopy, paracentesis, liver biopsy, central venous access, dental procedures, radiofrequency ablation or surgery. In these patients, platelet count needs to be taken into account in conjunction with the urgency and bleeding risk of the procedure. Avatrombopag was shown to decrease the requirement for platelet transfusion or rescue in patients with chronic liver disease and thrombocytopenia undergoing scheduled procedures by Terrault et al. [18].

Likewise, lusutrombopag is another therapeutic alternative for patients with chronic liver disease with severe thrombocytopenia who require an upcoming procedure. Meta-analysis and systematic review demonstrated that lusutrombopag led to better platelet recovery, fewer platelet transfusion requirements and fewer bleeding events than placebo, and did not significantly increase the number of thrombotic events [19]. Despite the lack of an evaluation of therapeutic interventions or post-procedural bleeding outcomes in the present study, these findings are relevant to clinical practice. [20]. Thus, assessment of the severity of thrombocytopenia is of practical importance in cirrhotic patients, particularly for the planning of invasive procedures. Platelet transfusion or a thrombopoietin receptor agonist should be individualised, however, depending on the type of procedure, severity of underlying liver disease, history of bleeding, risk of bleeding, and institutional protocol.

The major strength of this study is the local tertiary-care information regarding the prevalence, severity and clinical associations of thrombocytopenia among patients of liver cirrhosis. It also identifies clinically relevant variables such as age, gender, duration of cirrhosis and Child-Pugh class. But there are certain limitations to the study. It took place in one centre only, making it somewhat difficult to generalise. This cross-sectional design does not allow for causal interpretation. Aetiology of cirrhosis, spleen size, portal vein diameter, viral status, bleeding episodes, platelet transfusion need, thrombopoietin receptor agonist use and long-term clinical outcome were not assessed in the study. Future multicentre prospective studies should include these variables to better define the clinical and prognostic role of thrombocytopenia in cirrhotic patients.

Conclusion

The present descriptive cross-sectional study revealed that the thrombocytopenia is a common and clinically significant haematological disorder in liver cirrhosis. The most common level of severity was moderate thrombocytopenia. Gender and duration of cirrhosis were not significantly related to thrombocytopenia but age and Child-Pugh class were. The results of this study indicate that thrombocytopenia should be taken into account as a routine evaluation in clinical practice in cirrhotic patients. Timely identification and monitoring according to severity could help to make safer clinical decisions, especially prior to invasive interventions.

References

1. Asrani SK, Devarbhavi H, Eaton J, Kamath PS. Burden of liver diseases in the world. J Hepatol. 2019;70(1):151-171.
2. Angeli P, Bernardi M, Villanueva C, Francoz C, Mookerjee RP, Trebicka J, et al. EASL clinical practice guidelines for the management of patients with decompensated cirrhosis. J Hepatol. 2018;69(2):406-460.
3. Greer JP, Arber DA, Glader B, List AF, Means RT Jr, Paraskevas F, Rodgers GM. Wintrobe's Clinical Hematology. Asia Book Registry; 2019.
4. Afdhal N, McHutchison J, Brown R, Jacobson I, Manns M, Poordad F, et al. Thrombocytopenia associated with chronic liver disease. J Hepatol. 2008;48(6):1000-1007.
5. Drolz A, Horvatits T, Roedl K, Rutter K, Staufer K, Kneidinger N, et al. Coagulation parameters and major bleeding in critically ill patients with cirrhosis. Hepatology. 2016;64(2):556-568.
6. Marot A, Henrion J, Knebel JF, Moreno C, Deltenre P. Alcoholic liver disease confers a worse prognosis than HCV infection and non-alcoholic fatty liver disease among patients with cirrhosis: an observational study. PLoS One. 2017;12(10):e0186715.
7. Mehmood CHZ, Shah ZH, Sajad Q, Farooq N. Frequency of thrombocytopenia and its severity among patients of chronic liver disease

presenting to a tertiary care hospital. Pak J Med Health Sci. 2022;16(1):155-156.
8. Abbas MU, Sardar J, Asim M, Khan R, Khan S, Jaffar G. Frequency of thrombocytopenia in patients with chronic liver diseases in a tertiary care hospital. Pak J Med Health Sci. 2022;16:739-741.
9. Chen H, Liu L, Qi X, He C, Wu F, Fan D, et al. Efficacy and safety of anticoagulation in more advanced portal vein thrombosis in patients with liver cirrhosis. Eur J Gastroenterol Hepatol. 2016;28(1):82-89.
10. Kondo T, Maruyama H, Sekimoto T, Shimada T, Takahashi M, Okugawa H, et al. Impact of portal hemodynamics on Doppler ultrasonography for predicting decompensation and long-term outcomes in patients with cirrhosis. Scand J Gastroenterol. 2016;51(2):236-244.
11. Scharf RE. Thrombocytopenia and hemostatic changes in acute and chronic liver disease: pathophysiology, clinical and laboratory features, and management. J Clin Med. 2021;10(7):1530. doi:10.3390/jcm10071530.
12. Gallo P, Terracciani F, Di Pasquale G, Esposito M, Picardi A, Vespasiani-Gentilucci U. Thrombocytopenia in chronic liver disease: physiopathology and new therapeutic strategies before invasive procedures. World J Gastroenterol. 2022;28(30):4061-4074. doi:10.3748/wjg.v28.i30.4061.
13. Fierro-Angulo OM, González-Regueiro JA, Pereira-García A, Ruiz-Margáin A, Solis-Huerta F, Macías-Rodríguez RU. Hematological abnormalities in liver cirrhosis. World J Hepatol. 2024;16(9):1229-1246. doi:10.4254/wjh.v16.i9.1229.
14. European Association for the Study of the Liver. EASL clinical practice guidelines on prevention and management of bleeding and thrombosis in patients with cirrhosis. J Hepatol. 2022;76(5):1151-1184. doi:10.1016/j.jhep.2021.09.003.
15. O'Shea RS, Davitkov P, Ko CW, Rajasekhar A, Su GL, Sultan S, et al. AGA clinical practice guideline on the management of coagulation disorders in patients with cirrhosis. Gastroenterology. 2021;161(5):1615-1627.e1. doi:10.1053/j.gastro.2021.08.015.
16. Roberts LN, Lisman T, Stanworth S, Hernández-Gea V, Magnusson M, Tripodi A, et al. Periprocedural management of abnormal coagulation parameters and thrombocytopenia in patients with cirrhosis: guidance from the SSC of the ISTH. J Thromb Haemost. 2022;20(1):39-47. doi:10.1111/jth.15562.
17. Alvaro D, Caporaso N, Giannini EG, Iacobellis A, Morelli M, Toniutto P, et al. Procedure-related bleeding risk in patients with cirrhosis and severe thrombocytopenia. Eur J Clin Invest. 2021;51(6):e13508. doi:10.1111/eci.13508.
18. Terrault N, Chen YC, Izumi N, Kayali Z, Mitrut P, Tak WY, et al. Avatrombopag before procedures reduces need for platelet transfusion in patients with chronic liver disease and thrombocytopenia. Gastroenterology. 2018;155(3):705-718. doi:10.1053/j.gastro.2018.05.025.
19. Orme ME, Bentley R, Marcella S, Peck-Radosavljevic M, Perard R, Wedemeyer H, et al. Systematic review with meta-analysis: efficacy and safety of lusutrombopag for severe thrombocytopenia in patients with chronic liver disease undergoing invasive procedures. Adv Ther. 2022;39(9):4169-4188. doi:10.1007/s12325-022-02235-w.
20. Ding Z, Wu Q, Wen H, Zhang Y, Wang W, Li J, et al. Lusutrombopag for thrombocytopenia in Chinese patients with chronic liver disease undergoing invasive procedures. Hepatol Int. 2023;17(1):180-189. doi:10.1007/s12072-022-10421-9.