

Prevalence of Thrombocytopenia Amongst Patients with Cirrhosis Presenting to Shaheed Saif Ur Rehman Government Hospital, Gilgit

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Abstract: Thrombocytopenia is a common complication in patients with cirrhosis, often impacting clinical management. Understanding its frequency and associations can enhance early diagnosis and treatment strategies. **Objective:** To determine the frequency of thrombocytopenia among patients with cirrhosis and identify factors associated with its occurrence. **Methods:** A cross-sectional study was conducted after obtaining ethical approval from the Shaheed Saif-Ur-Rehman Government Teaching Hospital, Gilgit, and the CPSP (December 26, 2024, to March 26, 2025). The study included 190 patients who met the selection criteria, and written informed consent was obtained from each participant. Comprehensive physical and clinical examinations were performed, and a liver ultrasound was conducted to confirm cirrhosis. Blood samples were analyzed to assess platelet counts, with thrombocytopenia defined as a platelet count below 150,000 per cubic millimeter. A pre-designed proforma recorded demographic data, disease duration, and body mass index (BMI). Statistical analysis was performed using SPSS version 25. **Results:** The mean age of participants was 45.63±9.08 years, with 37.4% being above 50 years. Males represented 54.2% of the sample. The mean BMI was 26.87±3.56 kg/m², and the mean disease duration was 8.43±2.32 months. Urban residents comprised 60.0% of the sample. Monthly income distribution showed that 43.7% earned Rs. 40,000-80,000, and 35.8% earned less than Rs. 40,000. Most were from low socioeconomic backgrounds (52.1%), and 37.4% were illiterate. Thrombocytopenia was observed in 57.9% of patients, with a significant association found only with urban residence ($p = 0.03$). No significant associations were found with age, gender, income, or education. **Conclusion:** Thrombocytopenia is prevalent in more than half of cirrhotic patients, with a substantial association observed with urban residence. No significant links were found with age, gender, socioeconomic status, income, or education. Regular monitoring of platelet counts is crucial for the early detection and management of thrombocytopenia in cirrhotic patients. Further studies are needed to explore contributing factors and improve treatment strategies.

Keywords: Thrombocytopenia, cirrhosis, frequency

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Introduction

Cirrhosis is a common complication of acute and chronic liver injury that involves progressive destruction and regeneration of the liver parenchyma, leading to fibrosis.(1) It is characterized by replacing normal hepatic tissue with fibrotic tissue, resulting in the distortion of hepatic architecture and the impairment of liver function. It represents the final stage of various liver disorders, including viral hepatitis, alcoholic liver disease, non-alcoholic fatty liver disease, and autoimmune liver diseases. Cirrhosis poses significant health burdens worldwide, contributing to increased morbidity and mortality rates. Among the numerous complications associated with cirrhosis, thrombocytopenia is one of the most common hematological abnormalities observed in these patients. (2) Thrombocytopenia, defined as a platelet count below 150,000 per cubic millimeter, is frequently encountered in patients with cirrhosis. The prevalence rate varies from 15% to 70%, depending on the underlying etiology and severity of liver disease.(3) The development of thrombocytopenia in cirrhotic patients is multifactorial, involving mechanisms such as splenic sequestration of platelets due to splenomegaly, reduced thrombopoietin production by the liver, and increased platelet destruction mediated by immune mechanisms.(4) The presence of thrombocytopenia in cirrhotic patients is of significant clinical importance as it is associated with increased bleeding risk, particularly during invasive procedures, and serves as a marker of disease severity.(5) Thrombocytopenia is associated with significantly high mortality and morbidity in chronic liver disease and cirrhosis. It is used as a predictor of mortality and hepatic encephalopathy in cirrhotic patients.(6, 7)

The prevalence of thrombocytopenia among cirrhotic patients varies across different populations, influenced by factors such as disease etiology, demographic characteristics, and socioeconomic conditions.(8) Identifying the frequency of thrombocytopenia and its associated risk factors in cirrhotic patients is crucial for guiding clinical management and improving patient outcomes. Understanding the distribution of thrombocytopenia among cirrhotic patients can help in risk stratification and timely intervention to prevent bleeding complications.

The present study aims to determine the frequency of thrombocytopenia among patients with cirrhosis who present to Shaheed Saif-ur-Rehman Government Hospital, Gilgit. The findings will provide valuable insights into the burden of thrombocytopenia in cirrhotic patients and assist in developing targeted management strategies to improve the quality of care for this vulnerable patient population.

Objective:

To determine the frequency of thrombocytopenia amongst patients with cirrhosis.

Methodology

This cross-sectional study was conducted at the Department of General Medicine, Shaheed Saif-ur-Rehman Government Teaching Hospital, Gilgit, from December 26, 2024, to March 26, 2025, aiming to determine the prevalence of thrombocytopenia in patients with cirrhosis. The sample size was calculated using the WHO sample size calculator, considering a known prevalence of thrombocytopenia of 61.4% in cirrhotic patients, with a 95% confidence level and a margin of error of 6.94%.(6) This resulted in a required sample size of 190 patients. Non-probability



consecutive sampling was employed to recruit eligible patients who met the inclusion criteria. Patients presenting to the Department of General Medicine with cirrhosis during the study period were considered for inclusion.

Inclusion criteria for the study were patients aged 18-60 years, both male and female, diagnosed with cirrhosis lasting more than six months, and irrespective of the disease severity (Child-Pugh A, B, or C). All patients provided written informed consent to participate. Exclusion criteria included patients with concurrent illnesses capable of inducing thrombocytopenia, such as malaria, dengue fever, immune thrombocytopenic purpura (ITP), hematological malignancies, systemic lupus erythematosus (SLE), leukemia, and aplastic anemia. Additionally, patients on medications known to cause thrombocytopenia or those who had received platelet transfusions within the past seven days were excluded. Pregnant women were also excluded from the study.

After receiving ethical approval from the ethical committee of Shaheed Saif-ur-Rehman Government Teaching Hospital and the CPSP, detailed medical histories were obtained from all eligible patients, followed by a thorough physical examination. Ultrasound imaging confirmed liver cirrhosis, and blood samples were collected to assess platelet counts. Thrombocytopenia was defined as a platelet count of less than 150,000 per cubic millimeter. Demographic details, including age, gender, residence (rural/urban), education, monthly income, and socioeconomic status, were recorded using a pre-designed proforma. Disease duration and body mass index (BMI) were also documented.

The data collected were entered into the Statistical Package for Social Sciences (SPSS) Version 25 for analysis. Descriptive statistics were used for all variables, with quantitative variables, such as age, BMI, and disease duration, being expressed as mean $\pm$ standard deviation (SD) or median (interquartile range, IQR), depending on the normality of the data, assessed using the Shapiro-Wilk test. Categorical variables, including gender, residence, education, monthly income, socioeconomic status, and thrombocytopenia, were summarized as frequencies and percentages. Stratification was performed to examine the effects of age, gender, residence, education, monthly income, and socioeconomic status on the presence of thrombocytopenia. The chi-square test or Fisher's exact test was applied to assess associations between categorical variables, with a p-value of less than 0.05 considered statistically significant.

Results

The mean age of the participants was 45.63 ± 9.08 years. Among the age groups, 13 (6.8%) participants were between 18 and 30 years, 47 (24.7%) between 31 and 40 years, 59 (31.1%) between 41 and 50 years, and 71 (37.4%) were above 50 years. Regarding gender distribution, 103 (54.2%) participants were male, while 87 (45.8%) were female. The mean BMI of the participants was 26.87 ± 3.56 kg/m², while the mean disease duration was 8.43 ± 2.32 months. Regarding residence, 76 (40.0%) participants were from rural areas, and 114 (60.0%) were from urban areas. Based on monthly income, 68 (35.8%) participants earned less than Rs. 40,000, 83 (43.7%) had an income between Rs. 40,000 and Rs. 80,000, and 39 (20.5%) earned more than Rs. 80,000. Educational status revealed that 71 (37.4%) participants were illiterate, 70 (36.8%) had primary education, 35 (18.4%) had secondary education, and 14 (7.4%) had higher education. Socioeconomic status indicated that 99 (52.1%) participants belonged to the low socioeconomic group, 58 (30.5%) to the middle group, and 33 (17.4%) to the high group. Thrombocytopenia was present in 110 (57.9%) participants, while 80 (42.1%) participants did not have thrombocytopenia.

The stratification of thrombocytopenia, which involved different variables among the study participants, demonstrated varying distributions. Age-wise stratification showed that thrombocytopenia was present in 8 (7.3%) participants aged 18-30 years, 24 (21.8%) in the 31-40 years group, 36 (32.7%) in the 41-50 years group, and 42 (38.2%) in

those above 50 years ($p = 0.74$). Gender stratification indicated thrombocytopenia in 59 (53.6%) males and 51 (46.4%) females ($p = 0.85$). Based on socioeconomic status, thrombocytopenia was observed in 54 (49.1%) participants from the low group, 36 (32.7%) from the middle group, and 20 (18.2%) from the high group ($p = 0.61$). Monthly income stratification showed thrombocytopenia in 38 (34.5%) participants earning less than Rs. 40,000, 49 (44.5%) in those earning between Rs. 40,000-80,000, and 23 (20.9%) in those earning more than Rs. 80,000 ($p = 0.91$). Residence-based stratification revealed that thrombocytopenia was significantly higher in 73 (66.4%) participants from urban areas compared to 37 (33.6%) from rural areas ($p = 0.03$). Educational status stratification showed thrombocytopenia in 45 (40.9%) illiterate participants, 36 (32.7%) with primary education, 22 (20.0%) with secondary education, and 7 (6.4%) with higher education ($p = 0.42$).

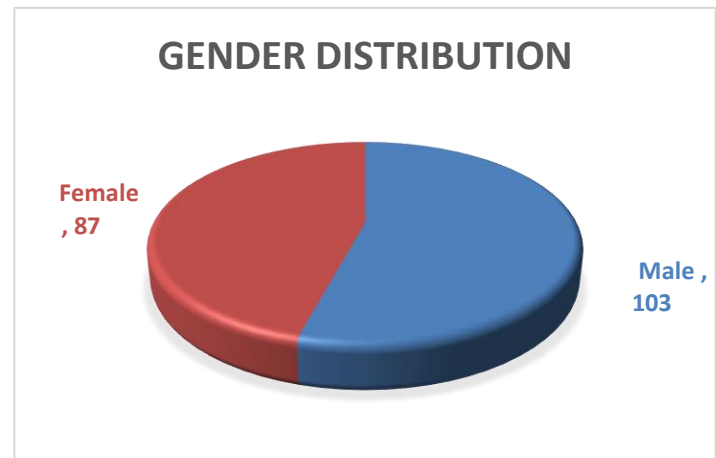


Figure 1: Frequency of patients based on gender

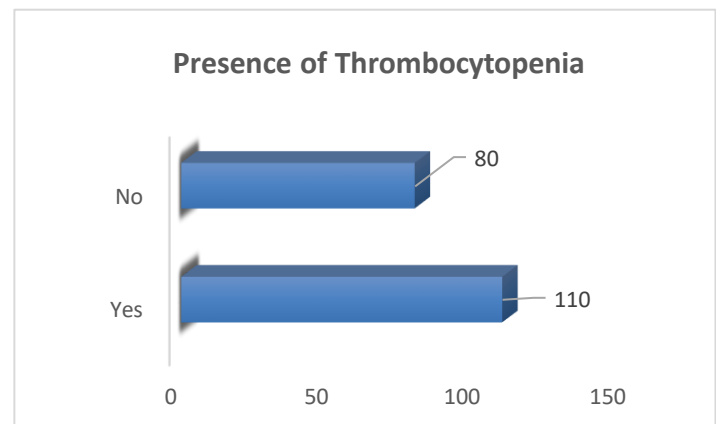


Figure 2: Frequency of patients based on Thrombocytopenia

Table 1: Descriptive Statistics for Quantitative Variables of all enrolled patients (n=190)

Variables	Mean $\pm$ SD/ n (%)
Age	45.63 $\pm$ 9.08
Age Groups	
18-30 years	13(6.8%)
31-40 years	47(24.7%)
41-50 years	59(31.1%)
>50 years	71(37.4%)
Gender	
Male	103(54.2%)
Female	87(45.8%)

Table 2: Descriptive Statistics of Anthropometric, Demographic, and Health-Related Variables among Study Participants (n=270)

Variables	Mean±SD/ n (%)
BMI (kg/m ²)	26.87± 3.56
Disease Duration (months)	8.426±2.32
Residence	
Rural	76(40.0%)
Urban	114(60.0%)
Monthly income (Rs)	
<40000	68(35.8%)
40000-80000	83(43.7%)
>80000	39(20.5%)
Education	
Illiterate	71(37.4%)
Primary	70(36.8%)
Secondary	35(18.4%)
Higher	14(7.4%)
Socioeconomic status	
Low	99(52.1%)
Middle	58(30.5%)
High	33(17.4%)
Thrombocytopenia	
Yes	110(57.9%)
No	80(42.1%)

Table 3: Stratification of Thrombocytopenia concerning different variables (n=190)

	Thrombocytopenia		p-value
	Yes	No	
Age groups			
18-30 years	8(7.3%)	5(6.3%)	0.74
31-40 years	24(21.8%)	23(28.8%)	
41-50 years	36(32.7%)	23(28.8%)	
>50 years	42(38.2%)	29(36.3%)	
Gender			
Male	59(53.6%)	44(55.0%)	0.85
Female	51(46.4%)	36(45.0%)	
Socioeconomic status			
Low	54(49.1%)	45(56.3%)	0.61
Middle	36(32.7%)	22(27.5%)	
High	20(18.2%)	13(16.3%)	
Monthly income (Rs)			
<40000	38(34.5%)	30(37.5%)	0.91
40000-80000	49(44.5%)	34(42.5%)	
>80000	23(20.9%)	16(20.0%)	
Residence			
Rural	37(33.6%)	39(48.8%)	0.03
Urban	73(66.4%)	41(51.3%)	
Education			
Illiterate	45(40.9%)	26(32.5%)	0.42
Primary	36(32.7%)	34(42.5%)	
Secondary	22(20.0%)	13(16.3%)	
Higher	7(6.4%)	7(8.8%)	

Discussion

Thrombocytopenia is a common hematological complication in patients with cirrhosis, significantly impacting disease prognosis and management. (9) Understanding its prevalence and associated factors is crucial for timely diagnosis and appropriate treatment. However, there is limited data on the frequency of thrombocytopenia among cirrhotic patients in Gilgit. The present study aimed to evaluate the frequency of

thrombocytopenia among patients with cirrhosis presenting to Shaheed Saif Ur Rehman Government Hospital, Gilgit, for better clinical management and improved patient outcomes in the local population. The present study's findings revealed that thrombocytopenia was a common hematological abnormality among cirrhotic patients, with an overall prevalence of 57.9%. Our study was supported by the study conducted by Muhammad Abbas et al., in which they stated that 116(61.4%) patients had thrombocytopenia.(6) Another study also reported a higher frequency

of thrombocytopenia.(10) As stated in our study, thrombocytopenia was more commonly identified in adults. Numerous epidemiological studies have demonstrated that the incidence of immune thrombocytopenia (ITP) rises after 60 years, reaching its peak in patients over 80 years. (11) In the present study, age-wise stratification showed a higher prevalence of thrombocytopenia among older participants, with most cases observed in individuals above 50. This trend may be attributed to the increased severity and duration of liver disease in older patients. However, the association between age and thrombocytopenia was not statistically significant ($p = 0.74$), which aligns with prior research suggesting that age alone is not a decisive factor in developing thrombocytopenia in cirrhotic patients. Gender does not appear to affect the manifestation of immune thrombocytopenia. (12) In the present study, gender stratification indicated that thrombocytopenia was slightly more common among males than females. About socioeconomic status, thrombocytopenia was predominantly observed in the low socioeconomic group (49.1%), followed by the middle (32.7%) and high (18.2%) socioeconomic groups. Although this difference did not reach statistical significance ($p = 0.61$), the trend suggests that individuals from lower socioeconomic backgrounds may face barriers to timely healthcare access and early diagnosis, potentially contributing to the progression of liver disease and subsequent hematological complications. Stratification based on monthly income revealed a higher prevalence of thrombocytopenia among participants earning between Rs. 40,000-80,000 (44.5%) and those earning less than Rs. 40,000 (34.5%), while participants with a monthly income exceeding Rs. 80,000 exhibited a lower prevalence (20.9%). However, the observed association between income and thrombocytopenia was not statistically significant ($p = 0.91$), indicating that income level alone may not serve as a definitive determinant of thrombocytopenia in cirrhotic patients. A statistically significant association was identified between residential status and thrombocytopenia, with urban participants demonstrating a higher prevalence (66.4%) compared to their rural counterparts (33.6%) ($p = 0.03$). This disparity may be attributed to variations in environmental exposures, lifestyle factors, and healthcare accessibility between urban and rural populations. Educational attainment analysis indicated that thrombocytopenia was more prevalent among illiterate participants (40.9%) and those with primary education (32.7%), whereas lower prevalence rates were observed among participants with secondary (20.0%) and higher education (6.4%). However, this association was not statistically significant ($p = 0.42$), implying that educational status alone may not directly influence the prevalence of thrombocytopenia in cirrhotic patients. These findings underscore the substantial burden of thrombocytopenia among cirrhotic patients and emphasize the critical need for regular hematological monitoring in this population. Further large-scale studies are warranted to elucidate the underlying mechanisms contributing to thrombocytopenia and to identify potential therapeutic interventions. Moreover, initiatives aimed at enhancing healthcare access, education, and socioeconomic support, particularly in underserved and rural communities, could play a pivotal role in mitigating the burden of thrombocytopenia in patients with cirrhosis.

Conclusion

The study revealed a high frequency of thrombocytopenia in cirrhotic patients, affecting more than half of the participants. Urban residence was significantly associated with thrombocytopenia, while no notable links were found with age, gender, socioeconomic status, income, or education. Routine platelet count monitoring is essential for early detection and management. Further studies are recommended to explore contributing factors and optimize treatment strategies.

Declarations

Data Availability statement

All data generated or analysed during the study are included in the manuscript.

Ethical approval and consent to participate

Approved by the department concerned. (IRBEC-SRUR-985-24)

Consent for publication

Approved

Funding

Not applicable

Conflict of interest

The authors declared the absence of a conflict of interest.

Author Contribution

ZR (PGR)

Manuscript drafting, Study Design, Review of Literature, Data entry,

MJ

Data analysis and drafting articles.

Study Design, manuscript review, and critical input.

All authors reviewed the results and approved the final version of the manuscript. They are also accountable for the integrity of the study.

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