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Frequency of Thrombocytopenia in Chronic Hepatitis C

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ABSTRACT

Background: Thrombocytopenia, characterized by a reduced platelet count, is commonly reported with chronic hepatitis C virus (HCV) infection. Effective management of thrombocytopenia in HCV-infected patients typically involves addressing the underlying viral infection, monitoring platelet levels, and implementing treatments to manage the platelet count or alleviate symptoms. **Objective:** To find out the frequency of thrombocytopenia in chronic hepatitis C virus infection. **Methods:** A cross-sectional study on chronic hepatitis C patients was conducted at the Medicine department of Shaheed Mohtarma Benazir Bhutto Medical University (SMBBMU) Hospital Larkana. The study duration was six months, from September 27, 2023, to March 26, 2024. One hundred and fifty-nine patients were consecutively enrolled and assessed for chronic HCV duration, symptoms and treatment. Blood samples were collected aseptically and evaluated for complete blood count (CBC) to confirm thrombocytopenia. Data was recorded in a predesigned proforma and analyzed with the Statistical Package for Social Sciences (SPSS). **Results:** Of the 159 chronic HCV patients, thrombocytopenia was found in 30.2% (n=48) patients. Male patients were 66.0% (n=105) and female patients were 34.0% (n=54). The mean age was 41.68 years with a standard deviation of ±13.01. **Conclusion:** Thrombocytopenia was present in a significant number of the patients presented with chronic HCV infection. This highlights the significance of monitoring platelet levels in patients with chronic HCV to manage and mitigate potential complications.

INTRODUCTION

Infection with the hepatitis C virus (HCV) is a serious public health issue that progresses gradually and doesn't show any signs of HCV infection for the first ten years. The subsequent phases of infection manifest with the liver-related symptoms [1, 2]. Unfortunately, most of the HCV infection patients are unable to eradicate the virus and develop a chronic infection. This percentage is lower in children and women and greater in patients suffering from human immunodeficiency virus (HIV) [3].

According to the World Health Organization (WHO), approximately 50 million people worldwide are infected with chronic HCV, with 1.0 million new cases reported each year. Approximately 242,000 deaths worldwide are also caused by HCV [4]. Pakistan ranks among the countries with the highest incidence of HCV-related illness and death. HCV is also one of the major causes of hospital admissions. Pakistan ranks second worldwide in HCV infections, with 4.8% of the population infected with the virus. According to an analysis of 90 distinct studies carried out in Pakistan, 11.5% of the country's adult population was infected with HCV. Baluchistan had the highest prevalence of HCV (25.77%), followed by Khyber Pakhtunkhwa (6.07%), Punjab (5.46%), federally managed tribal areas (3.37%), and Sindh (2.55%) [5, 6].

Chronic HCV infection not only damages the liver but also causes a number of systemic diseases, some of which have morbidities that are more severe than the disease of the liver itself. These are extrahepatic manifestations of chronic HCV infection. These are common and include a broad spectrum of diseases, from the presence of a few clinically unimportant autoantibodies to disorders affecting several organ systems. Cryoglobulinemia, B-cell non-Hodgkin lymphoma, membranoproliferative glomerulonephritis, nephrotic syndrome, lichen planus, and porphyria cutanea tarda are some of the most common extrahepatic manifestations of chronic HCV infection [7, 8].

Thrombocytopenia is a disorder characterized by a decrease in platelet count and is associated with high rates of morbidity, particularly bleeding and transfusion, as well as mortality. It might be difficult to diagnose new thrombocytopenia since it can be associated with a number of other diseases [9, 10]. Thrombocytopenia (TCP), which is associated with a significant number of individuals with chronic HCV, is considered a serious problem worldwide. Thrombocytopenia is caused by a complex pathophysiology, including auto-

immunogenicity, direct bone marrow suppression, reduced thrombopoietin production, hypersplenism, and adverse drug reactions [11, 12]. Effective management of thrombocytopenia in HCV-infected patients typically involves addressing the underlying viral infection, monitoring platelet levels, and implementing treatments to manage the platelet count or alleviate symptoms [13, 14].

Thrombocytopenia is one of the important clinical manifestations especially in patients suffering from chronic HCV infection. Therefore, the objective of this study is to find out the current frequency of thrombocytopenia in chronic HCV infection in a tertiary care hospital of Larkana. Study outcome will be helpful in early determining current frequency of thrombocytopenia in patients with chronic HCV infection and that will help in designing appropriate management strategies in order to decrease the burden of thrombocytopenia in chronic HCV infection.

METHODOLOGY

A cross-sectional study on chronic hepatitis C patients was conducted at the Medicine department of Shaheed Mohtarma Benazir Bhutto Medical University (SMBBMU) Hospital Larkana. The study duration was six months, from September 27, 2023, to March 26, 2024. The sample size calculation was done by utilizing the Online Open Epi sample size software. A sample size of 159 was calculated by using the study of Sarwar et al. who observed the 28.0% of HCV patients with thrombocytopenia [15], with a confidence interval of 95% and a margin of error of 7%.

This study consecutively enrolled patients who were (1) diagnosed with chronic HCV infection, (2) males and females, and (3) adults aged 18-60 years. The study excludes (1) diagnosed cases of immune thrombocytopenic purpura, (2) diagnosed cases of decompensated liver disease, and (3) diagnosed cases of chronic HCV infection who were not willing to be part of the study.

Approval for this study was obtained from the Research Evaluation Unit (REU) of the College of Physicians and Surgeons of Pakistan (CPSP). The study significance and objectives were explained to diagnosed cases of chronic HCV infection, and written informed consent was taken. Patients visiting the outpatient department (OPD), of medicine Unit I of SMBBMU) Hospital Larkana, fulfilling the inclusion criteria were selected and demographic details of each patient were obtained.

Each patient was evaluated for the duration of illness from chronic HCV and the duration of treatment. Each patient was evaluated for present signs and symptoms such as easy or excessive bruising, reddish-purple spots on the skin, increased bleeding time from cuts (>9 minutes), blood in urine or stools, bleeding from nose or gums, or fatigue. HCV infection was confirmed when the virus was present on the anti-HCV test using the ELISA method. Chronic HCV infection was confirmed when the virus was present for more than six months. Blood samples were collected aseptically and evaluated for complete blood count (CBC) to confirm thrombocytopenia. Thrombocytopenia was diagnosed on a platelet count of <150,000 cells/µL. Data was recorded in a predesigned proforma and analyzed with the SPSS version 25.0.

RESULTS

The gender distribution among the participants reveals that 66.0% (n=105) were male, whereas 34.0% (n=54) were female. The mean age was 41.68 years with a standard deviation of ±13.01. The age distribution of the participants indicates that 57.9% (n=92) were in the age range of <50 years, while 42.1% (n=67) were in the age range of >50 years. The residential status of the participants indicates that 67.3% (n=107) reside in urban areas, while 32.7% (n=52) live in rural areas. The educational status of the participants indicates that 11.3% (n=18) were illiterate, 15.1% (n=24) had received primary education, 37.1% (n=59) had secondary education, 17.6% (n=28) had completed intermediate education, and 18.9% (n=30) had achieved graduation [Table 1].

Table 1

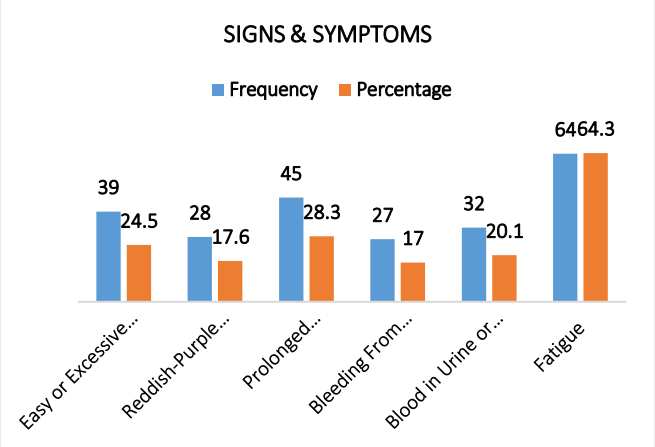
Demographics Variables in Chronic HCV Patients (n=159)

Demographic Variables		Frequency	Percentage
Gender	Male	105	66.0%
	Female	54	34.0%
Age (Years)	Mean ± SD	41.68±13.01	
	18-50	92	57.9%
	51-60	67	42.1%
Residence	Urban	107	67.3%
	Rural	52	32.7%
Educational Status	Illiterate	18	11.3%
	Primary	24	15.1%
	Secondary	59	37.1%
	Intermediate	28	17.6%
	Graduate	30	18.9%

The mean duration of chronic HCV was 18.39 months with a standard deviation of ±11.19. The most common symptom in chronic HCV patients was fatigue, reported by 64.3% of participants (n=64). The other symptoms include prolonged bleeding from cuts in 28.3% of participants (n=45), easy or excessive bruising in 24.5% of participants (n=39), blood in urine or stools in 20.1% of participants (n=32), reddish-purple spots on the skin in 17.6% of participants (n=28), and bleeding from the gums or nose in 17.0% of participants (n=27) [Figure 1].

Figure 1

Sign and Symptoms in Chronic HCV Patients

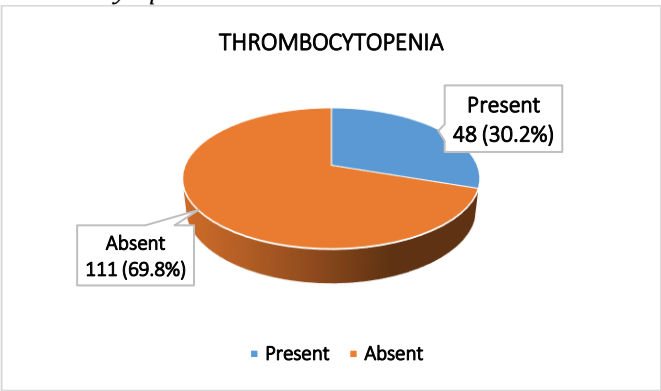


The mean duration of treatment for chronic HCV was 23.00 months with a standard deviation of ±11.63. The

mean platelet count was 228088.05/L with a standard deviation of ±95972.59. Thrombocytopenia was present in 30.2% of participants (n=48) and absent in 69.8% of participants (n=111) [Figure 2].

Figure 2

Thrombocytopenia in Chronic HCV Patients



Risk factors such as gender, age, residence, education, duration of chronic HCV and chronic HCV treatment with thrombocytopenia were analyzed, and all risk factors indicated non-significant differences [Table 2].

Table 2

Risk Factors and Thrombocytopenia in Chronic HCV Patients (n=159)

Risk Factors		Present (n=48)	Absent (n=111)
Gender	Male	34 (70.8%)	71 (64.0%)
	Female	14 (29.2%)	40 (36.0%)
Age (Years)	Mean ± SD	43.4±12.5	40.9±13.2
	18-50	26 (54.2%)	66 (59.5%)
	51-60	22 (45.8%)	45 (40.5%)
Residence	Urban	35 (72.9%)	72 (64.9%)
	Rural	13 (27.1%)	39 (35.1%)
Educational Status	Illiterate	5 (10.4%)	13 (11.7%)
	Primary	10 (20.8%)	14 (12.6%)
	Secondary	20 (41.7%)	39 (35.1%)
	Intermediate	6 (12.5%)	22 (19.8%)
	Graduate	7 (14.6%)	23 (20.7%)
Duration of Chronic HCV	6-18 months	30 (62.5%)	64 (57.7%)
	>18 months	18 (37.5%)	47 (42.3%)
Duration of Treatment	9-18 months	23 (47.9%)	51 (45.9%)
	>18 months	25 (52.1%)	60 (54.1%)

DISCUSSION

Thrombocytopenia, characterized by a low platelet count in the blood, is a common hematological complication associated with patients presented with chronic HCV infection. Chronic HCV infection can lead to significant liver damage, manifesting as chronic hepatitis, cirrhosis, or even hepatocellular carcinoma. The liver is essential for the synthesis and control of thrombopoietin, a hormone that stimulates platelet production. In chronic HCV infection, liver dysfunction or cirrhosis can disrupt this balance, leading to reduced platelet production and thrombocytopenia [16-18].

Management of thrombocytopenia in HCV-infected patients often involves addressing the underlying liver disease and, in some cases, specific treatments targeting the HCV. Improved management of the liver condition can help restore platelet counts and reduce the risks associated with thrombocytopenia. Thrombocytopenia in chronic HCV infection presents a significant clinical challenge, as it affects not only the management of liver disease but also patient outcomes and quality of life [19, 20].

Several studies from around the world and Pakistan have documented the frequency of thrombocytopenia in patients with chronic HCV infection, but no study has been conducted in the local population of Larkana. Therefore, this study was conducted at a tertiary care hospital in Larkana to find out the current frequency of thrombocytopenia in chronic HCV infection.

In this study, the gender distribution among the participants reveals that 66.0% (n=105) were male, whereas 34.0% (n=54) were female. Similar male dominance was reported by other researchers during investigation of thrombocytopenia in patients of chronic HCV. A study by Sarwar et al. reports that 61.0% of the participants were male, whereas 39.0% of the participants were female [15]. A study by Rahman et al. reports that 59.0% of the participants were male, whereas 41.0% of the participants were female [21]. A study by Taqveem et al. reports that 69.2% of the participants were male, whereas 30.8% of the participants were female [22]. A study by Rehman et al. reports that 57.95% of the participants were male, whereas 42.05% of the participants were female [23]. Males are mostly suffering from chronic HCV infection due to their higher exposure to transmission risk factors such as unsafe medical practices (intravenous drug use, blood transfusion, reused syringes, etc.) and cosmetic practices (using shared razors or other instruments in barbershops, etc.).

In this study, the mean age was 41.68 years with a standard deviation of ±13.01. The age distribution of the participants indicates that 57.9% (n=92) were in the age range of <50 years, while 42.1% (n=67) were in the age range of >50 years. A similar higher mean age was reported by other researchers during the investigation of thrombocytopenia in patients with chronic HCV. Different studies, such as Sarwar et al. [15], Rahman et al. [21], and Rehman et al. [23], reported the mean ages of 44.98±10.62 years, 39±10.24 years, and 40.88±12.94 years, respectively. Adults aged 40 years and older are more likely to develop chronic HCV infection because HCV has a long incubation period and develops silently. Most people are infected with the virus early in life, but symptoms and complications appear decades later.

In this study, thrombocytopenia was found in 30.2% (n=48) of the participants. A similar higher prevalence of thrombocytopenia was reported by other researchers during the investigation of thrombocytopenia in patients with chronic HCV. A study by Sarwar et al. reported that 28% of HCV patients had thrombocytopenia [15]. Rahman S, et al. reported that 22% of HCV patients had thrombocytopenia [21]. Taqveem et al. reported 38.8% of HCV patients had thrombocytopenia [22]. Rehman et al. reported 28.0% of HCV patients had thrombocytopenia [23].

The pathogenies of thrombocytopenia in chronic HCV infection is multifactorial. Firstly, the virus can cause direct damage to the liver, impairing its ability to produce thrombopoietin. Additionally, the development of portal hypertension, a common consequence of cirrhosis, leads to splenomegaly (enlargement of the spleen). An enlarged spleen can sequester platelets, reducing their number in

the bloodstream. Furthermore, the presence of HCV can also trigger immune-mediated destruction of platelets, exacerbating the thrombocytopenic state [10, 15, 20-23].

The presence of thrombocytopenia in HCV-infected patients can complicate both the diagnosis and management of liver disease. Low platelet counts increase the risk of bleeding complications, which can impact the patient's ability to undergo invasive procedures or surgeries. Furthermore, thrombocytopenia can influence treatment decisions, particularly in the context of antiviral therapies. For instance, certain direct-acting antivirals (DAAs) used in HCV treatment might need dose adjustments or special monitoring in patients with severe thrombocytopenia [24, 25].

Management strategies for thrombocytopenia in HCV-infected individuals often focus on addressing the underlying liver disease. Successful antiviral treatment of HCV can lead to improvements in liver function, reduction in portal hypertension, and potential normalization of platelet counts. In cases where thrombocytopenia is severe, additional therapeutic interventions such as platelet transfusions or medications to stimulate platelet production might be necessary [19, 24, 25].

CONCLUSION

It is to be concluded that that thrombocytopenia was present in a significant proportion of the patients. This highlights the importance of monitoring platelet levels in individuals with chronic hepatitis C to manage and mitigate potential complications. Thrombocytopenia in chronic HCV infection is a multifaceted issue that requires a comprehensive approach to management. Addressing the underlying liver disease and considering both direct and indirect factors contributing to thrombocytopenia are essential for optimizing patient outcomes.

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