

ORIGINAL ARTICLE

Hepatitis C Virus Infection in Patients with Beta Thalassemia after Multiple Transfusions at a Tertiary Care HospitalFAREEHA NASEER SYED¹, NADIA KASHIF², MUBASHIR RAZZAQ KHAN³, FAYAZ AHMED MEMON⁴, MUHAMMAD ZUBAIR JABBAR⁵, SUJITH KUMAR PALLETI⁶¹Assistant Professor of Pathology, Department of Pathology, CMH Multan Institute of Medical Sciences, Multan.²Assistant Professor, Department of Pathology, Jinnah Medical College/District Specialist Naseerullah Babar Memorial Hospital, Peshawar.³Assistant Professor of Pathology, Faisalabad Institute of Cardiology, Faisalabad.⁴Professor, Department of Medicine, Muhammed Medical College & Hospital, Mirpurkhas, Sindh.⁵Demonstrator, Department of Oral Pathology, Rehman College of Dentistry, Rehman Medical Institute Peshawar.⁶MD, Loyola University Medical Center, Illinois

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ABSTRACT**Aim:** To assess the prevalence of hepatitis C virus among patients of beta-thalassemia.**Methods:** We enrolled 200 patients of beta-thalassemia in this observational cross sectional study conducted at Department of Pathology, Jinnah Medical College/District Specialist Naseerullah Babar Memorial Hospital, Peshawar in the duration from March, 2022 to August, 2022. We determined the frequency of HCV in beta-thalassemia patients and assessed the association of HCV with age groups and number of blood transfusions. Chi Square test was used for association keeping P value at < 0.05 as statistically significant.**Results:** Patients' average age recorded was 11.07±4.98 years. Male patients were 53.5% while the female patients were 46.5%. The frequency of HCV in our study was 37 (18.5%). HCV was significantly associated the number of blood transfusion < 7.**Conclusion:** Patients of beta-thalassemia are at higher risk of having. The frequency of hepatitis C virus in our study was 37 (18.5%).**Keywords:** Beta-thalassemia, Hepatitis C virus, Prevalence**INTRODUCTION**

Hepatitis C Virus is an RNA virus specie that lives in the family Flaviviridae and therefore is classified in the genus Hepacivirus. Hepatitis C virus is a spherical, enclosed virus with (+) RNA sense¹. Patients with a background of numerous blood transfusions, those with hepatitis C, and those on hemodialysis are considered to have an abnormally high HCV occurrence^{2, 3}. In most cases, hepatitis C virus infestations are chronic and the exposures to the virus are undiagnosed. In addition, individuals with HCV only have occasional morphologies, such as moderate jaundice and irregularities in liver enzymes⁴.

The virus is contained to the liver and rarely spreads to other organs. Furthermore, conventional blood tests frequently fail to detect HCV infection. Needle-stick sharing, unprotected sex, mother-to-child transmission, hemodialysis, and transfusion of blood are all potential transmission routes¹. Infection with hepatitis C virus is more likely to occur in patients who have undergone hemodialysis or undergone several blood transfusions⁵.

Patients with beta-thalassemia already face a significant challenge without the added stress of an active HCV infection. Hemoglobin-globin chain production is disrupted in those with beta thalassemia, an underlying genetic condition. Individuals with thalassemia have severe anaemia and need regular blood transfusions^{6, 7}.

Patients with thalassemia are at increased risk for contracting blood borne microbiological infectious disorders, among other issues stemming from the need for frequent blood transfusions⁸. This has the potential to worsen thalassemia victims' health and quality of life, and perhaps raise their risk of complications and fatality. Prevention of transmission remains the core of care for patients with beta thalassemia due to the lack of a vaccination for HCV infection⁹. Recognizing the potential risks associated with antiviral treatment is also crucial. This highlights the importance of rigorous HCV monitoring of blood and blood-related products^{10, 11}.

The present study was initiated to determine the frequency of HCV infection among the patients with beta-thalassemia presenting to our local health setup. The outcome of this study will be helpful in the management of critical patients by designing effective patients screening and care protocols.

MATERIAL AND METHODS

This cross sectional study was conducted at at Department of Pathology, Jinnah Medical College/District Specialist Naseerullah Babar Memorial Hospital, Peshawar in the duration from March, 2022 to August, 2022. Written consent was obtained from the parents/guardians of the patients. We enrolled 200 patients diagnosed with beta-thalassemia in the study using non probability consecutive sampling. Patients having previous history of hepatitis C virus or liver disease were excluded. Basic demographics of all patients were recorded. The frequency of hepatitis C virus was determined in all patients.

Data was analyzed using IBM SPSS 20. For age we calculated mean and standard deviation. For gender, number of blood transfusions, hepatitis C virus and age distribution we used frequencies and percentages. Hepatitis C virus was assessed for association with age groups and number of blood transfusions by using Chi Square test of association. P value was kept at < 0.05 for statistical significance.

RESULTS

This study was conducted on 200 patients presenting with beta-thalassemia. The mean age of the patients was 11.07±4.98 years. The frequency of male patients was 53.5% while the frequency of female patients was 46.5%. Most of the patients were in the age group of > 10 years 58% while in the age distribution of 1 to 10 years there were 42% patients. The frequency of HCV in our study was 37 (18.5%). According to the number of blood transfusions 91 (45.5%) patients had less than or equal to 7 transfusions while 109 (54.5%) patients had > 7 transfusions.

We observed that the prevalence of HCV increased with increasing age, patients in the age groups of 1 to 10 years had 37.8% prevalence of HCV while patients in the age group of >10 years had 62.2% prevalence of HCV.

Table 2 shows the association of HCV with blood transfusions. Those patients who had less than or equal to 7 transfusions had lower prevalence of HCV (27%) while those patients who had blood transfusions more than 7 times had significantly prevalence of HCV 73%.

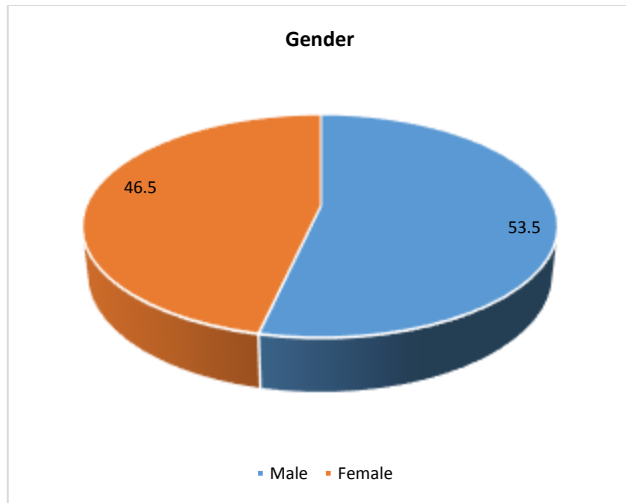
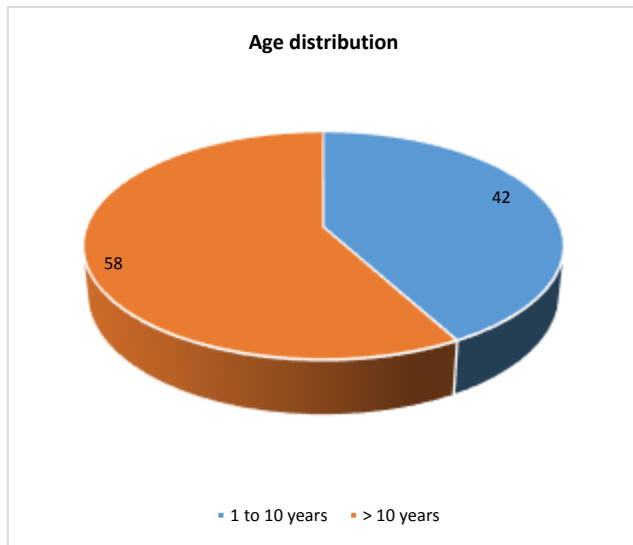


Figure 1: Gender distribution



Graph 2: Age distribution

Table 1: Number of blood transfusions

Blood transfusion	Frequency	Percent
<= 7	91	45.5
> 7	109	54.5
Total	200	100.0

Table 2: Association of HCV with age groups

		Age distribution		Total	P value
		1 to 10 years	> 10 years		
HCV	Yes	14 37.8%	23 62.2%	37 100.0%	0.57
	No	70 42.9%	93 57.1%	163 100.0%	
Total		84 42.0%	116 58.0%	200 100.0%	

Table 2: Association of HCV with blood transfusions

		Number of blood transfusion		Total	P value
		<= 7	> 7		
HCV	Yes	10 27.0%	27 73.0%	37 100.0%	0.01
	No	81 49.7%	82 50.3%	163 100.0%	
Total		91 45.5%	109 54.5%	200 100.0%	

DISCUSSION

Millions of children worldwide are impacted by the beta-thalassemia, which are among the most prevalent genetic illnesses. Around 1.5% (80–90 million people) of the world's population are beta-thalassemia carriers, and 50,000–60,000 new cases are reported every year¹². The populations of Asia, the Indian subcontinent, the Mediterranean nations, Africa, and the Middle East are the ones most likely to have beta-thalassemia. With a carrier frequency of 5 to 7%, beta-thalassemia is one of the most prevalent inherited diseases in Pakistan. Because blood transfusions and iron chelation are now available, people with beta-thalassemia are living longer. Currently, there are about 100,000 patients registered, but the illness burden is growing because 5000 to 9000 infants are born every year with the ailment.¹³

In Pakistan, bloodborne infections are the second most frequent cause of mortality for people with beta-thalassemia. Patients with beta-thalassemia who get frequent blood transfusions are more likely to become infected with the HCV virus, especially if adequate viral screening of blood donors has not been carried out¹⁴. Due to their significant exposure to blood transfusions, patients with beta-thalassemia have an infection risk that is a good indicator of the population's risk of transfusion-transmitted illnesses. It follows that the risk to the general population will be negligible if the infection rate is low among those with betabeta-thalassemia¹³.

One of the most prevalent blood borne illnesses is hepatitis C. In Pakistan, more than 10 million people have HCV infection, making them susceptible to significant morbidity and mortality rates. Pakistan is one of the world's developing nations; out of 189 countries and territories, it ranks 150th on the UN's Human Development Index¹⁵. Pakistan's health standards fall well short of the global norms that other nations strive towards. As a result, receiving infected blood transfusions continues to be a major risk factor for HCV transmission. This is a result of the widespread use of paid blood donors and the lack of screening. The incidence of HCV in beta-thalassemia patients in Pakistan has been the subject of numerous investigations, and there is wide heterogeneity in the prevalence reported in the various published studies.¹⁶

In our study the prevalence of HCV infection in beta-thalassemia patients was 37 (18.5%). Several studies from Pakistan have reported a HCV prevalence of 20.5% to 60%¹⁷. A meta-analysis of 27 studies conducted in Pakistan reported that the pool prevalence of HCV in beta-thalassemia patients was 36.21%¹². A recent study from conducted in India reported 28% prevalence of HCV in beta-thalassemia patients¹⁸.

Our results revealed that the prevalence of HCV in thalassemia patients increased with increasing age. We observed that patients who were greater than 10 years of age had higher frequency of HCV but it was not statistically significant. Same observation has been reported by the aforementioned meta-analysis conducted in Pakistan.

We also observed that the patients who had higher frequencies of blood transfusion had significantly higher prevalence of HCV. The number of blood transfusions is related to an increased hazard of HCV infection. Our findings are in line with the above mentioned meta-analysis from Pakistan¹² which also reported that increase number of blood transfusions can lead to getting HCV.

CONCLUSION

From are study we conclude that the patients of beta-thalassemia are highly exposed to the hepatitis C virus. The frequency of hepatitis C virus in our study was 37 (18.5%). The findings of the current study and the body of literature suggest that thalassemia patients are becoming more susceptible to HCV infections and may thus serve as infection reservoirs. Large-scale screening, prevention, and management initiatives are necessary to stop the spread of HCV infection because there isn't a licensed vaccine.

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