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PREVALENCE OF HEPATIS B AND C AMONG BETA THALASSEMIA MAJOR PATIENTS AT A TERTIARY CARE HOSPITAL.

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ABSTRACT

Introduction: The beta-thalassemia are among the most prevalent hereditary diseases, and they influence the lives of millions of children all over the world. Because appropriate viral screening of donated blood has never been carried out, the infection risk in -thalassemia individuals serve as a signal for the hazard of transfusion-transmitted illnesses, specifically hepatitis B and C as well as other viral infections. **Objective:** To determine the prevalence of hepatitis B and C among beta-thalassemia major patients at a tertiary care Hospital.**Material and methods:** This descriptive cross-sectional study was done at the pediatric department at ***SKBZ/AK, CMH*** Hospital Muzaffarabad, during a period of six months from October 2019 to March 2020. All the beta thalassemia major patients, aged up to 15 years, and both genders, were included. Following informed consent, a 3-5 mL blood sample was collected from each case and immediately sent to the hospital diagnostic laboratory to screen for HCV and HVB infections using the Elisa method. All the informatiosn was collected via a study proforma, and SPSS version 26 was used for data analysis.**Results:** A total of 87 patients with beta thalassemia major were studied; their mean age was 10.0±3.68 years. Males were 55.8% and females were 44.8%. Out of all 35.6% patients were infected by HCV, while only one patient found with HCV and HBV co-infection. As per the stratification, HCV infection was significantly linked to age more than 10 years (p-0.001), while statistically insignificant according to gender (p-0.344). **Conclusion:** As per the study conclusion, HCV infection was observed to be highly prevalent among patients with beta-thalassemia major. It was positively related to the blood transfusions. Unfortunately, due to the high incidence of these viruses in individuals with beta thalassemia, it would appear that the precautions used in blood preparation and testing to prevent infections that are transferred by blood transfusion are still insufficient.

Key words: HCV, HBV, *β*-thalassemia, transfusions

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INTRODUCTION

As thalassemia is an inherited condition, at least one of a patient's parents has to be the carrier of such a disorder for them to be affected.[1] A child must inherit one defective gene from each of their parents in order to have the condition.[1] Beta thalassemia major results in decreased or missing beta globin chain production because of homozygous mutations in the genes of beta globin. It happens when two individuals (marry with them) are carriers of beta thalassemia, and depending on the autosomal recessive illness's probability, there has been a 25% possibility of a child with thalassemia major, a 50% possibility of a carrier or trait, as well as a 25% possibility of a normal child with each pregnancy. Individuals with thalassemia major have both defective alleles and suffer from severe anemia, necessitating regular red blood cell transfusions for survival. [3] Several people around the world who suffer from BTM have an inadequate ability to receive regular and risk-free blood transfusions.[4] There is a substantial gap between the timely supply of safe blood and the demand for it, and several factors contribute to this gap, including a shortage of volunteer nonremunerated donors of blood, inadequate knowledge of thalassemia, a deficiency of regional blood policies, and scattered blood facilities.[4] Blood transfusion-related infections, which can include infections caused by bacteria, viruses, and parasites, are a severe risk that is linked to receiving regular blood transfusions.[4,5] Although because of the requirement of receiving frequent blood transfusions, those who have beta-thalassemia major have an increased risk of contracting blood-borne viral diseases, including HBV and HCV. The rate of HCV transmission among individuals who regularly undergo blood transfusions, such as those suffering from beta-thalassemia major, has reduced due to proper and effective blood screening in developed countries, while there is still a greater rate of HCV infection compared to the overall rate of HCV infection in developing countries.[7-9] Even though screening donated blood for viruses prior to its use in transfusions has become standard practice, viruses can still be passed on even from healthy blood donors.[10] In addition, when there is an immediate demand for blood, the patients occasionally get their blood transfusions from professional blood donors.[10,11] In addition to the hazards that are already posed to patients by repeated and frequent blood transfusions, an infection with the hepatitis B or C virus further complicates the patient's survival. However, this has been done to explore the recent knowledge regarding the transmission rate of HCV and HBV infection among continuously undergoing blood transmitted patients with beta thalassemia major at the local level.

MATERIAL AND METHODS

This descriptive cross-sectional study was done at the pediatric department at ***Skbz/AK, CMH*** Hospital Muzaffarabad. The duration of the study was six months, from October 2019 to March 2020. All patients with beta thalassemia major who had a history of continuous frequent blood transfusions and

were up to 15 years old and of both genders were included. All the newly diagnosed patients, patients having history of less than three blood transfusions, and individuals who declined to participate in the study were excluded. Study was done after takin ethical approval form the institute and a written and verbal informed consent was taken from each of the patient or their caretakers. A 3 to 5 ml blood sample was obtained from each case and immediately sent to the hospital diagnostic laboratory to screen out the HCV and HVB infections by the Elisa method. All the information was collected via a study proforma, and SPSS version 26 was used for data analysis. Categorical variables were presented in frequency and percentage, while numerical variables were presented in mean and standard deviation. Post-stratification, the hi-square test was applied, and a p-value $\leq$ 0.05 was considered as significant.

RESULTS

A total of 87 patients with beta-thalassemia major were screened out for hepatitis viral infection, their mean age was 10.0±2.68 years. Males were in majority 55.2% and females were 44.8%. The majority of cases (47.1%) had a low socioeconomic status, followed by cases with a middle socioeconomic status (37.5%) and 14.9% with an upper socioeconomic status. Table.1

Out of all the study subjects, 33.3% of the cases had HCV positivity; only HBV infection was not found, while HCV and HBV co-infection was noted in only one patient. Fig:1

The frequency of HCV infection was statistically significant according to age (p=0.004), while it was statistically insignificant according to gender (p = 0.647). Table.2

The frequency of HBV and HCV co-infection was statistically insignificant according to age and gender (p= >0.05). Table.3

Table. 1. Demographic characteristics of the patients n=87

Variables		**Descriptive statistics**	
Mean age		10.0±2.68 years	
Gender	Males	48	55.2%
	Females	39	44.8%
	Total	87	100.0%
Socioeconomic status	Poor	41	47.1%
	Middle	33	37.9%
	Upper	13	14.9%

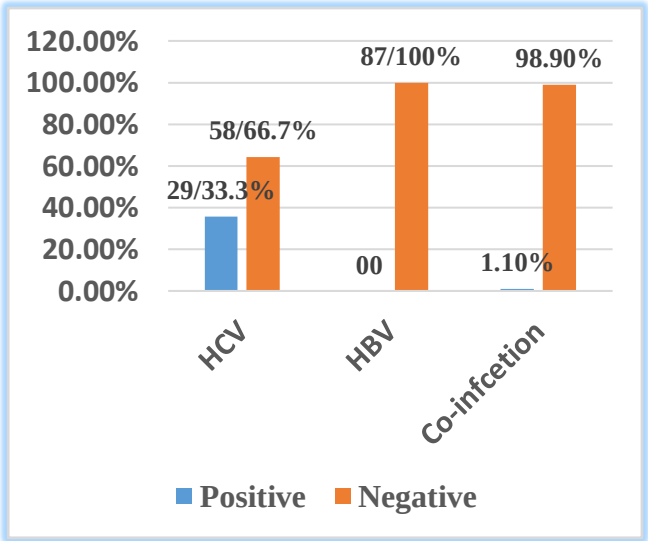

Fig:1 Frequency of HCV and HBV infections n=87

Table. 2. HCV infection according to age and gender n=87

Variables		Hepatitis C virus		Total	p-value
		Positive	Negative		
Age groups	1-5 years	0	6	6	0.004
		0.0%	6.9%	6.9%	
	5-10 years	8	31	39	
		9.2%	35.6%	44.8%	
	11-15 years	21	21	42	
		24.1%	24.1%	48.3%	
Gender	Males	15	33	48	0.647
		17.2%	37.9%	55.2%	
	Female	14	25	39	
		16.1%	28.7%	44.8%	

Patients suffering from thalassemia are need to have regular blood transfusions, that improves their life but also raises the risk of contracting viral infections such as HBV, HCV and HIV.[10] This study has been done to evaluate the determine the occurrence of hepatis B and C among Beta thalassemia major patients and 87 patients of bet thalassemia major were screened out for hepatitis viral infection, their mean age was 10.0±2.68 years, males were in majority 55.2% and most of the cases 47.1% were poor socioeconomically.Table. 3. Co-infection according to age and gender n=87

Variables		Co-infection		Total	p-value
		Positive	Negative		
Age groups	1-5 years	0	6	6	0.264
		0.0%	6.9%	6.9%	
	5-10 years	1	38	39	
		1.1%	43.7%	44.8 %	
	11-15 years	0	42	42	
		0.0%	48.3%	48.3 %	
Gender	Males	0	48	48	0.537
		0.0%	55.2%	55.2 %	
	Female	1	38	39	
		1.1%	43.7%	44.8 %	

In the comparison of our findings Mahmood M et al[10] reported that the mean age of patients of beta thalassemia major was 7.51± 4.67 years and males were 54.9%. On the other hand, Nadir R et al[7] reported that the patients mean age was 9.76±5.26 years, while they found both genders with equal ratio. In the line of the study 10.30±4.65 years and consistently they found males in majority 56.3%. It is challenging to account for the fact that there were more male participants in this study than female participants. The fact that the individuals are more concerned with the health of their male kids and, as a result, are more inclined to seek medical care for them is one of the probable explanations for this phenomenon.[12]

In this study out of all study subjects, 33.3% of the cases had HCV positive, only HBV infection was not found, while HCV+HBV co-infection was noted only in one patient. KOUSAR T et al[13] also found similar rate of HCV in the children undergoing multiple blood transfusions, while they found 5.9% hepatitis B virus transmitted rate, which is higher than our findings. In the study by Nadir R et al[7] reported that there have been a total of9.3% individuals, who tested positive for HBV and 31.7%, who tested positive for HCV. Khalil S et al[9] demonstrated that the around 31(38.7%) had HCV positive and only four cases had HBV positive. Although according to a meta-analysis, the rate of HCV infection the cases of beta-thalassemia was 45.98% in province of Punjab, 31.81% in province of Sindh, and 28.04% in province of Khyber Pakhtunkhwa.[14] In the study of Khan MR et al[15] demonstrated that the 45.96% patients of beta thalassemia major were positive hepatitis C antibodies and 4.68% cases had had Hepatitis B.

In this study the frequency of HCV infection was statistically significant according to age

(p=0.004) and it was statistically insignificant according to gender (p = 0.647), while frequency HBV and HCV co-infection was statistically insignificant according to age and gender (p= >0.05). Consistently KOUSAR T et al[13] reported that the occurrence of hepatitis B and C were seemed statistically non-significant as per gender stratification. Although Hama SA et al[16] reported that the in the hepatitis C infection was 29.1%, hepatitis B was 22.5%, HDV was 3.3%, HCV-HBV coinfection was 5%, while co-infection of HCV-HBV-HDV was 0.83% and age was significantly linked to the HBV (p = 0.009), while in this study only HBV infection was negative. In another study also found comparable findings.[17] According to the results of the previous publications carried out in developing countries,[18-20] in the patients of thalassemia, the higher frequency of patients tested positive for HCV; the findings are practically higher than our findings and other recent studies, which is showing that the transmitted rate of hepatitis B and C is some decreased but still significant concern and efforts are needed to completely prevent it. Although this study contains various limitations, though future large-scale studies and metanalysis are needed to observed the final definitive recent prevalence, because there is still controversies and no exact data found notably at local level.

CONCLUSION

As per the study conclusion, HCV infection was observed to be the highly prevalent among patients of Beta thalassemia major. It was positively related to the blood transfusions. Unfortunately, due to the high incidence of these viruses in individuals having beta thalassemia, it would appear that the precautions used in blood preparation and testing to prevent infections that are transferred by blood transfusion are still insufficient. However, strong preventive strategies should be developed to prevent the viral transmitted infection rate because these patients are already at high risk of several other transfusion related systemic complications.

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