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ORIGINAL ARTICLE

Examine the Prevalence of Hepatitis C Virus in Multi-Transfused Thalassemia Major Patients

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ABSTACT

Objective: To examine the prevalence of Hepatitis C virus in multi-transfused thalassemia major patients and risk factors associated with HCV infection.

Study Design: Cross-sectional/Observational

Place and Duration: Department of Medicine/ Haematology, Lahore General Hospital, Lahore, Pakistan for the duration of six months from March 2021 to August 2021.

Methods: One hundred and sixty five multi-transfused patients of β thalassemia major were enrolled in this study. After taking informed consent patients' demographics including age, sex, socioeconomic status, residence and blood transfusion frequency were recorded. Blood sample was taken from all the patients to examine the seroprevalence of Hepatitis C virus by using ELISA method. Data was analyzed by SPSS 24.0.

Results: There were 113(68.48%) males and 52 (31.52%) female patients. 71 (43.03%) patients were ages >10 years and 94 (56.97%) patients were ages <10 years. 48 (29.09%) patients were found to have HCV positive. Among HCV positive patients males were predominant 33 (68.75%), 37 (77.08%) patients had above 15 transfusion and 11 (22.92%) had less than 15 transfusion. Patients with low socio-economic status were on high risk for developing HCV infection.

Conclusion: It is concluded that Hepatitis C virus is significantly associated with multi-tranfused Beta thalassemia major. The frequency of HCV infection is quite high.

Keywords: Multi-transfusion, Beta Thalassemia Major, Hepatitis C virus

INTRODUCTION

The β-thalassemias are among the most common genetic diseases and affect millions of children throughout the world [1]. Around 1.5% (80-90 million people) of the global population are carriers for -thalassaemia, with 50,000-60,000 new -thalassemia patients being born each year [2] thalassemia is most prevalent in the populations of Asia, the Indian subcontinent, the Mediterranean region, Africa and the Middle East [3-5].

In Pakistan Beta thalassemia is one of the commonest inherited disorders, with a carrier frequency of 5% to 7% in the Pakistani population [2]. Beta thalassemia patients are now surviving to older ages due to the availability of blood transfusion and iron chelation. There are around 100,000 patients registered currently but the burden of disease is increasing, with 5,000 to 9,000 children born with the disorder annually [6]. Blood borne infections are the second commonest cause of death in Beta thalassemia patients in Pakistan [2]. Patients with Beta thalassemia are at high risk of developing hepatitis C (HCV) infection due to regular blood transfusions, especially if adequate viral screening of blood donors has not been undertaken.

The infection risk in Beta thalassemia patients acts as a marker for the risk of transfusion transmitted infections in the general population as their exposure to blood transfusions is high. If the infection rate is low in Beta thalassemia patients it means that the risk for the general population will be minimal. Hepatitis C virus is one of the most common blood borne viruses. More than 10 million people are living with Hepatitis C virus (HCV) in Pakistan with its associated high morbidity and mortality [7]. Pakistan is a developing country, and according to the human development index of the United Nations, it stands in 150th position out of 189 countries and territories [8]. The health standard in Pakistan is below the international level. Therefore, transfusion of contaminated blood is still a major risk factor for the spread of hepatitis C. This is due to the lack of appropriate donor screening and the widespread use of paid blood donors [9]. Several studies have been reported on the prevalence of HCV among β-thalassemia patients in Pakistan and there is considerable variation in the prevalence reported in the individually published studies. The present study was conducted to examine the frequency of HCV in Beta thalassemia major patients and its associated risk factors.

MATERIALS AND METHODS

This cross sectional study was conducted at Department of Medicine/ Haematology, Lahore General Hospital, Lahore, Pakistan for the duration of six months from March 2021 to August 2021. A total 165 male, female multi-transfused patients of Beta thalassemia major who received more than 10 blood transfusions with ages up to 15 years were enrolled in this study. After taking informed consent patients' demographics including age, sex, socioeconomic status, residence and blood transfusion frequency were recorded. Patients with history of HCV infection, patients with less than 10 blood transfusions and patients' mothers with HCV infection were excluded from this study.

2ml blood sample was taken from all the patients and sent to laboratory for examination. Hepatitis C Virus was examined by ELISA method. Prevalence of HCV infection was recorded. Risk factors such as age, gender, socio-economic status, residence and number of transfusion associated to HCV infection were examined. Data was analyzed by SPSS 24.0. Frequencies and percentages were recorded in tabulation form. Chi-square test was applied. P-value <0.05 was taken as significant.

RESULTS

Out of 165 patients 113 (68.48%) were males and 52 (31.52%) were female patients. 71 (43.03%) patients were ages >10 years and 94 (56.97%) patients were ages <10 years. 70 (42.42%) had low, 75 (45.45%) patients had middle and 20 (12.12%) had high socio-economic status. Majority of patients 98 (59.39%) patients had rural residency while 67 (40.61%) patients had urban residence. 110 (66.67%) patients had blood transfusion >15 and 55 (33.33%) patients had number of transfusion <15. (Table 1)

According to the risk factors we found no significant difference was observed regarding age and residence p-value >0.05. However, male gender, low socioeconomic status and number of blood transfusion more than 15 were significantly associated with Hepatitis C virus (HCV) with p-value <0.05. (Table 2)

Table 1: Baseline characteristics

Characteristics	Frequency No.	%age
Sex		
Male	113	68.48
Female	52	31.52
Age		
<10 Years	94	56.97
> 10 Years	71	43.03
Socio-eco Status		
Low	70	42.42
Middle	75	45.45
High	20	12.12
Residence		
Urban	67	40.61
Rural	98	59.39
No. of Transfusion		
<15	55	33.33
>15	110	66.67

Hepatitis C virus was positive in 48 (29.09%) patients while remaining 117 (70.91%) patients had negative findings. (Figure 1)

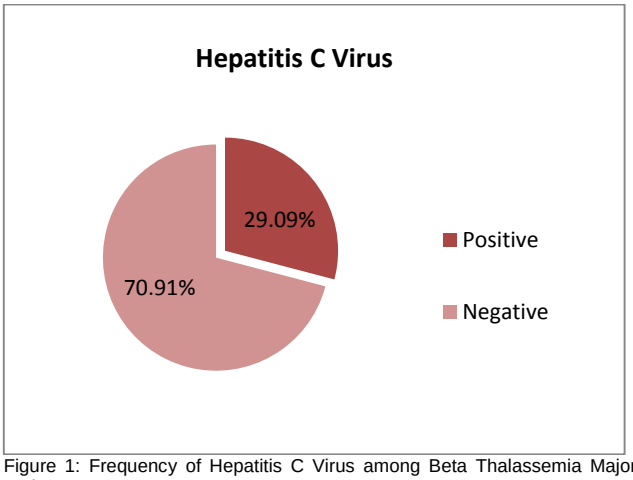

Figure 1: Frequency of Hepatitis C Virus among Beta Thalassemia Major Patients

Table 2: Risk Factors associated with HCV infection

Characteristics	HCV Positive (n=48)	HCV Negative (n=117)	P-value
Sex			0.012
Male (n=113)	33	80	
Female (n=52)	15	37	
Age (Years)			N/S
<10 (n=94)	25	69	
> 10 (n=71)	23	48	
Socio-eco Status			0.036
Low (n=70)	30	40	
Middle (n=75)	15	60	
High (n=20)	3	17	
Residence			N/S
Urban (n=67)	22	45	
Rural (n=98)	26	72	
No. of Transfusion			0.001
<15 (n=55)	11	44	
>15 (n=110)	37	73	

DISCUSSION

Beta thalassemia is one of the most common life threatening disorder in children with high rate of mortality and morbidity. Infectious diseases such as Hepatitis B, HCV and HIV are highly associated with Beta thalassemia major [10-11]. In Pakistan and other developing countries the prevalence of HCV infection is high as compared to developing countries [13]. The present study was conducted to examine the prevalence of HCV infection in multi-transfusion Beta thalassemia major patients. In this regard 165 patients of betal thalassemia major whom had blood transfusion more than 15 times were analyzed to examine HCV infection. In our study the prevalence of HCV infection in multi-transfused Beta thalassemia major patients was 29.09% out of 165 patients. A study conducted by Raza T et al [14] regarding frequency of HCV infection in Beta thalassemia major patients and they reported HCV positive in 53 (26.5%) out of 200 patients.

Another study by Yousefi M et al [15] reported that the prevalence of HCV infection in Beta thalassemia major patients was 8.5% out of 152 patients. A meta analysis conducted in Pakistan regarding HCV infection in multi-transfused Beta thalassemia major patients, in which out of 5789 Beta thalassemia major patients the frequency of HCV was 36.21% [16]. Some other studies demonstrated that HCV virus is significantly associated with Beta thalassemia major patients [17-18].

In present study we found that 113 (68.48%) were males and 52 (31.52%) were female patients. 71 (43.03%) patients were ages >10 years and 94 (56.97%) patients were ages <10 years. These results were similar to many of previous studies in which male patients were high in numbers as compared to females and majority of patients were ages 11 to 16 years [19]. We found 70 (42.42%) had low, 75 (45.45%) patients had middle and 20 (12.12%) had high socio-economic status. Majority of patients 98 (59.39%) patients had rural residency while 67 (40.61%) patients had urban residence. 110 (66.67%) patients had blood transfusion >15 and 55 (33.33%) patients had number of transfusion <15. These results were comparable to some other studies [14,16].

In present study according to the risk factors we found no significant difference was observed regarding age and residence p-value >0.05. However, male gender, low socioeconomic status and number of blood transfusion more than 15 were significantly associated with Hepatitis C virus (HCV) with p-value <0.05. Raza T et al [14] reported that Out of HCV positive patients, 38 were male and 15 were female, having a p-value of 0.01. However, no significant difference in term of age and number of blood transfusion. A study by Sinha MK et al [20] reported that Hepatitis C and HIV was prevalent among 59.3% and 4.1% of the study participants and the causes of high prevalence of HCV may be due to donors being usually asymptomatic in early stages, despite being screened for HCV possibly due to missing early window period infections.

CONCLUSION

Beta Thalassemia major is one of the common disorder in children with high rate of infectious diseases. We concluded from this study that Hepatitis C virus is significantly associated with multi-tranfused Beta thalassemia major. The frequency of HCV infection in our study is 29.09%. Also concluded that male gender, low socio-economic status and more blood transfusions are the major risk factors associated with HCV infection.

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