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Seroprevalence of Hepatitis B, Hepatitis C and Human Immunodeficiency Virus in Patients with Thalassemia Major in Zahedan, Southeast of Iran

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ABSTRACT

Background and objectives: Patients with thalassemia are at high risk of hepatitis B, hepatitis C, HIV infections because of the frequent and long-term need for blood transfusion. In the present study, we aimed to determine prevalence of hepatitis B virus (HBV), hepatitis C virus (HCV) and HIV in patients with thalassemia major in a hospital in Zahedan, Iran.

Methods: This descriptive study was performed on 289 thalassemia major patients (130 men and 159 women) who were referred to the Ali ibn Abi Talib hospital in Zahedan, Southeast of Iran. First, serum of patients was checked for presence of antibodies against HB surface antigen, HCV and HIV by ELISA, and then results were confirmed by immunoblotting. Data were analyzed with SPSS 21 software using chi-square test.

Results: Of the 289 patients, 11(3.8%) were anti-HBs positive, 11(3.8%) were anti-HCV positive, and none were positive for HIV antibodies. There was no significant difference in the prevalence of the viruses between different age groups. We found no significant correlation between history of HBV vaccination and the absence of infection with the virus in thalassemia patients.

Conclusion: Although the prevalence of HCV and HBV infection is not alarmingly high in thalassemia patients in Zahedan (Southeast of Iran), screening of blood donors using more sensitive detection techniques can effectively reduce the prevalence and incidence of these viral infections in this area.

KEYWORDS: Thalassemia major, Hepatitis B, Hepatitis C, AIDS

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INTRODUCTION

Transfusion-transmitted viral infections are a major health problem worldwide, especially in developing countries. Transfusion of blood or its components are often applied as a long-term treatment for patients with thalassemia, hemophilia and chronic renal failure [1-3]. Given the increasing use of hepatitis B virus (HBV) vaccine and screening of all donated blood for hepatitis B surface antigen (HBsAg), luckily, the blood transfusion-associated HBV infection rates have dropped dramatically. However, given the lack of vaccines, hepatitis C virus (HCV) and the human immunodeficiency virus (HIV) infections following blood transfusion are still a major challenge in patients with thalassemia [4]. Since 1995 and after serologic and molecular detection of HCV and screening of blood donations for the HCV antigen, the relative incidence of hepatitis C in thalassemia patients has decreased in many countries. However, many thalassemia patients still suffer from AIDS [5-7]. Today, due to the long-term complications of these viral infections, particularly cirrhosis and hepatocellular carcinoma, preventing contamination of blood products with blood-borne viruses is of great importance. Thalassemia is a common disease in Iran, and according to current statistics, the Sistan and Baluchistan Province is a high-prevalence area for the disease. In the present study, we determine the prevalence of HBV, HCV and HIV in patients with thalassemia major in a hospital in Zahedan, Iran.

MATERIALS AND METHODS

This descriptive study was performed on 289 major thalassemia patients (130 men and 159 women) who were referred to the Ali ibn Abi Talib hospital in Zahedan (Sistan and Baluchestan Province, Iran), between March and August 2017. After obtaining consent from all participants, demographic characteristics including age, ethnicity and vaccination history were collected using a questionnaire. Then, the results of serologic testing (using ELISA) for markers of HBV, HCV and HIV were extracted from patients' medical record. Positive cases for HCV and HIV were screened by immunoblotting assay (Pishtazteb Diagnostic, Iran). Data were analyzed with IBM SPSS Statistics 21 using the chi-square test. All statistical analyses were performed at significance level of 0.05.

RESULTS

Of 289 patients with thalassemia major, 11 (3.8%) were HBsAg positive, 11 (3.8%) were positive for HCV antibodies, but none were HIV-positive (Table 1).

Table 1. Results of serologic testing in patients with thalassemia major

Subjects	Results					
	Number of positives (%)		Number of negatives (%)		Total	P-value
	Male	Female	Male	Female		
HBsAg	3(1.03)	8(2.76)	127(43.94)	151(52.24)	289(100)	P> 0.05
Anti-HCV	7(2.42)	4(1.38)	123(42.56)	155(53.63)	289(100)	
Anti-HIV	0(0)	0(0)	130(44.98)	159(55.01)	289(100)	

The results of serologic tests had no significant correlation with sex, age and history of vaccination. The prevalence of HBV and HCV was highest (34.9%) in patients above the age of 51 years (Table 2).

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Table 2. Results of serologic testing in patients with thalassemia major based on age

Variable		Age group (years)							P-value
		≤ 10	11-20	21-30	31-40	41-50	≥51	Total	
HBsAg	Positive	0	3	1	0	1	6	289(100)	P>0.05
	Negative	24	14	65	43	37	95		
Anti-HCV	Positive	1	0	3	0	2	5	289(100)	
	Negative	23	17	63	43	36	96		
Anti-HIV	Positive	0	0	0	0	0	0	289(100)	
	Negative	24	17	66	43	38	101		

DISCUSSION

HBV is one of the most common human pathogens in the world, which is associated with significant morbidity and mortality (8). Patients with thalassemia major are at high risk of HBV infection (9). In our study, the HBsAg was detected in 3.8% of the patients with thalassemia major, which is somewhat higher than the rates reported in other studies. For example, in a study by Karimi and Ghavanini in Shiraz (Iran) on 755 patients with thalassemia, 0.53% of the patients were positive for the HBsAg (10). Moreover, in a study in Qazvin (Iran), the prevalence of HBsAg-positive thalassemia patients was 1.1% (11). In a study by Jamal et al. in Malaysia on 85 thalassemia patients, 2.3% of the patients were positive for the HBsAg (12). In Bangladesh, Khan et al. reported that 13.6% of children with thalassemia are positive for the HBsAg (13). According to a study in Italy, continuation of the hepatitis B vaccination program can reduce the risk of developing HBV infection through blood transfusion (14).

HCV is a major cause of viral hepatitis worldwide, and an estimated 2-3% of the world's population is living with HCV infection (15,16). However, prevalence rates may vary due to various factors including the type of selective testing for HCV, sensitivity of the test for the detection of HCV antibodies and performing annual blood screening. In a study in India, the incidence of HCV was 25.5% in thalassemia patients and 1.78% in healthy controls (16). In a recent study in Columbia, the seroprevalence of HCV was 32.2% in hemophilia patients, 1.6% in hemodialysis patients, 7.1% in patients (17).

In Bangladesh, the prevalence of HCV was 12.5% in children with thalassemia and 0.9% in healthy individuals (18). According to other studies in Iran, the prevalence of HCV in patients with thalassemia was 15.7% in Shiraz (10) and 24.2% in Qazvin (11).

CONCLUSION

Although the prevalence of HCV and HBV is not alarmingly high in thalassemia patients in Zahedan (Southeast of Iran), screening of blood donors using more sensitive detection techniques can effectively reduce the prevalence and incidence of these viral infections in this area.

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DECLARATIONS

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Ethics approvals and consent to participate

The study protocol was approved by the ethics committee of Islamic Azad University of Zahedan (ethical approval code: AE-MLS-WI-064-02).

Conflict of interest

The authors declare that there is no conflict of interest regarding publication of this article.

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