Seroprevalence of Hepatitis B, Hepatitis C and Human Immunodeficiency Viruses among Thalassemia Patients in West North of Iran

Valizadeh N MD 1,2*, Noroozi M MD 3, Hejazi S MD 4, Nateghi Sh MD 5, Hashemi A MD 6
1. Assistant professor of Hematology/Medical Oncology, Urmia University of Medical Sciences, Emam Khomeini Hospital, Urmia, Iran.
2. Assistant professor of Hematology/Medical Oncology, Tehran University of Medical Sciences, Shariati Hospital, Tehran, Iran.
3. Assistant professor of Pediatric Hematology/Medical Oncology, Department of Pediatric hematology, Motahari Hospital, Urmia University of Medical Sciences, Urmia, Iran.
4. Assistant professor of Pediatric Hematology/Medical Oncology, Department of pediatric hematology, Motahari Hospital, Urmia University of Medical Sciences, Urmia, Iran.
5. General physician, Urmia University of Medical Sciences, Urmia, Iran.
6. Assistant professor of Gastroenterology, Urmia University of Medical Sciences, Urmia, Iran.

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Abstract

Background
Thalassemia patients that are conventionally treated by a regular transfusion regimen are exposed to blood born viral infections. The aim of this study was to investigate the seroprevalence of hepatitis B virus (HBV), hepatitis C virus (HCV), and human Immunodeficiency virus (HIV) among all multitransfused thalassemia patients in west north of Iran.

Material and Methods
A retrospective study was conducted in February 2014, on 32 patients in Urmia, suffering from transfusion dependent thalassemia were admitted to Motahari and Emam Khomeini hospitals. Patients’ medical records were studied for HBs antigen and seropositivity for HCV, and HIV antibodies.

Results
Out of 32 transfusion dependent thalassemia patients aged between 5-17 years, 18 (56.25%) and 14 (43.75%) were male and female, respectively. All of them were found seronegative for HBs antigen, HCV, and HIV antibodies.

Conclusion
It seems that screening of blood products is efficient in Urmia, capital of West Azarbaijan, Iran for prevention of blood born viral infections.

Key Words
Antibody, HBs Antigen, HCV, HIV, Thalassemia, Transfusion

*Corresponding Author
Valizadeh N MD, Assistant professor of Hematology/Medical Oncology, Tehran University of Medical Sciences, Shariati Hospital, Tehran, Iran, Email: nzedaha0@gmail.com.

Introduction
Thalassemia is a form of hereditary anemia. Patients with thalassemia have deficiency in hemoglobin production and mild or severe anemia that lead to inappropriate oxygen transport to body tissues (1). Iran is situated in the middle of thalassemia belt and has a high frequency rate for thalassemia carrier (2). More than 25,000 cases of thalassemia major are reported in Iran (3). Although regular blood transfusion in patients with thalassemia has improved their overall survival and quality of life, but it can increase risk of transmission of blood born viral infections, especially viral hepatitis (4-6). A study on transfusion dependent thalassemia patients in Iran showed that the rate of hepatitis C infection was higher than hepatitis B infection (7). Despite recent success in screening of blood products, hepatitis C infection is remained as an important issue in transfusion dependent thalassemia patients (8-9). In a study conducted on 50 children with transfusion dependent thalassemia, 20% of participants were positive for hepatitis B, and 30% for hepatitis C infection (10). Mohamed R, et al. studied on prevalence of hepatitis C infection among children with β-thalassemia major in Mid Delta, Egypt, and concluded that
All participants were negative for HBsAg. HCV Ab by enzyme linked immunosorbant assay (ELISA) was positive in 76%, negative in 20%, and equivocal in 4% of participants. 40% of them had positive PCR for HCV (11).

Another study was conducted by Rehman M, et al. on transfusion dependent thalassemia patients in Pakistan and showed a HCV infection in 35%, hepatitis B infection in 1.7%, and HIV seropositivity in none of patients (12).

Prevalence of HCV infection in transfusion dependent thalassemia patients in Kuwait was also 33% (13).

We aimed to determine the seroprevalence of HBV, HCV, and HIV infections among multitransfused thalassemia patients in Urmia, capital of West Azarbaijan, Iran.

Material and methods: This retrospective study was done in February 2014 in Urmia, Iran, on 32 transfusion dependent thalassemia patients who were admitted to Motahari and Emam Khomeini hospitals. Medical records of patients were searched for HBs Ag, HCV antibody, and HIV antibodies. Patients had been tested for HBs Ag (HBs Ag Liaison S. P. A, Italy), human immunodeficiency virus (HIV) Ab, and hepatitis C virus Ab with enzyme linked immunosorbant assay (HCV & HIV Ab: Medical Biological Service, Milano Italy). This study approved in ethical committee of Urmia University of Medical Sciences. All information from medical records of patients is kept confidentially.

Results

All 32 patients with thalassemia major and intermedia, aged between 5 to 17 under regular blood transfusions were included. Out of all 32 patients 18 (56.25%) and 14 (43.75%) were male and female, respectively. Mean age of patients was 11.41 ± 3.18 years old. Mean value of ferritin level of patients was 1598.69 ± 605.174 ng/ml. Antibody to hepatitis B surface antigen (HBs Ab) levels 10 International Units/liter (IU/L) were considered protective. In 2 patients, HBs antibody titer was less than 10 IU/L (non protective) and for the rests (30 patients) was greater than 10 IU/L (protective).

All of them were seronegative for HBs antigen, HCV antibody, and HIV antibodies.

Discussion

In a study conducted by Ghaforian M, et al, on 206 thalassemia patients who were admitted to the Research Center of Thalassemia and Hemoglobino pathy of Ahvaz Shafa Hospital from March 2006 to April 2007, the overall prevalence rate of anti-HCV was 28.1% (14). In Arabic countries, prevalence of HCV infection in thalassemia patients ranges between 33 to 67.3% (13), (15), (16). The prevalence of hepatitis B infection association with transfusion was 0.57% in reports from England in 1991–1997(17). In a study conducted by Hussain H, et al. in Pakistan from January 2002 to December 2003, 180 β- thalassemia major children were enrolled and out of them, 75 (41.7%) children were hepatitis C positive (18).

Another study in Isfahan on 466 patients with major thalassemia during 1996-2011, was done and the prevalence of HCV was estimated 8% (19).

Shaker O, et al. studied for occult hepatitis B in Eighty Egyptian thalassemia children and found seropositivity for HCV , and HBV at 25% and 32.5%. (20). Bhavsar H, et al. studied the prevalence of HIV, hepatitis B, and hepatitis C infection in thalassemia major patients in tertiary care hospital, Gujarat, and found that out of 100 patients 18 (18%) were Anti HCV Ab positive, 6 (6%) were HBs Ag positive, and 9 (9%) were anti HIV 1 or 2 positive(21). Studies from India have reported that HIV seropositivity varies from 0 to 9.3 in multi transfused thalassemia children (22-23).

In another study from India, thirteen cases (2.8%) reported positive for HBs Ag by ELISA, 107 (23.1%) reactive for anti HCV, and 11 (2.38%) for anti HIV antibodies among 462 multitransfused thalassemia patients (24).

Tamaddoni A, et al. studied for seroprevalence of HCV antibody among Patients with β-Thalassemia major in Amirkola thalassemia Center located in Babol, Iran, on 64 females and 49 males. In their study; twelve (10.6%) cases were positive for anti-HCV antibody (25).

Ansari S studied for seropositivity of hepatitis C, hepatitis B, and HIV in chronically transfused β-thalassemia major patients in Pakistan and found that out of 160 patients, 21 cases (13.1%) were anti-HCV positive, and 2 (1.25%) were HBs Ag positive. However, HIV antibodies were not detected in any of participants (26). In this study all of 36 transfusion dependent thalassemia patients in
Urmia were found seronegative for HBs Ag, HCV antibody, and HIV antibodies. These results may be due to good quality of screening methods of blood products in Urmia. However, in comparison with other similar studies, the number of patients was fewer because the rate of thalassemia patients in West Azerbaijan, Iran was low.

**Conclusion**

All transfusion dependent patients with thalassemia major and intermedia in Urmia, the capital of West Azerbaijan, were seronegative for hepatitis B, hepatitis C, and human immunodeficiency viruses. It seems that screening of blood products is efficient in Urmia for prevention of blood born viral infections.

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**Conflict of interest**

The Authors have no conflict of interest.

**References**

1. Higgs DR, Thein SL, Woods WG. The molecular pathology of the thalassemias. In: Weatherall DJ, Clegg B, eds. The thalassemia syndromes. 4th ed. Oxford, England: Blackwell Science, 2001:133-91.
2. Abolghasemi H, Amid A, Zeinali S, Radfar MH, Eshghi P, Rahiminejad MS, et al. Thalassemia in Iran: Epidemiology, prevention, and management. J Pediatr Hematol Oncol 2007; 29:233-238.
3. Mirmoem S, Alvian SM, Hajarizadeh B, Kafaee J, Yektaparast B, Zahedi MAJ et al. Epidemiology of Hepatitis B, Hepatitis C, and Human Immunodeficiency Virus Infections in Patients with Beta-thalassemia in Iran: A Multicenter Study. Arch. Iran. Med. 2006;9(4):319-323.
4. Alvian SM, Adibi P, Zali MR. Hepatitis C virus in Iran: Epidemiology of an emerging infection. Arch. Iranian Med. 2005;8(2):84-90.
5. Albertl A, Benevgun L. Management of hepatitis C. J Hepatol. 2003;38 Suppl 1:S104-118.
6. Younus M, Hassan K, Ikram N, Naseem L, Zaheer H, A Khan MF. Hepatitis C Virus Seropositivity in Routinely Transfused Thalassemia Major Patients. International Journal of Pathology, 2004; 2:20-23.
7. Karimi M, Ghavanini AA. Seroprevalence of Hepatitis B, Hepatitis C and Human Immunodeficiency Virus Antibodies Among Multitransfused Thalassaemic Children in Shiraz, Iran. J Paediatr Child Health. 2001; 37:564-566.
8. Ocak S, Kaya H, Cetin M, Gali E, Ozturk M. Seroprevalence of hepatitis B and hepatitis C in patients with thalassemia and sickle cell anemia in a longterm Follow-up. Arch Med Res. 2006; 37:895-898.
9. Prati D, Maggioni M, Milani S, Cerino M, Cianciulli P, Coggi G, et al. Clinical and histological characterization of liver disease in patients with transfusion dependent beta-thalassemia. A multicenter study of 117 cases. Haematologica. 2004; 89:1179-1186.
10. Irshad M, Peter S. Spectrum of viral hepatitis in thalassemic children receiving multiple blood transfusions. Indian J Gastroenterol. 2002; 21:183-184.
11. El-Shanshory MR, Kabbash IA, Soliman HH, Nagy HM, Abdou SH. Prevalence of hepatitis C infection among children with beta-thalassemia major in Mid Delta, Egypt: a single centre study. Trans R Soc Trop Med Hyg. 2013; 107(4):224-228.
12. Rehman M, Lodhi Y. Prospects of future of conservative management of beta-thalassemia major in a developing country. Pak J Med Sci. 2004; 20:105-107.
13. Al-Fuzae L, Aboolbacker KC, Al-Saleh Q. Beta thalassemia major in Kuwait. J Trop Pediatr. 1998; 44:311-312.
14. Ghafourian Boroujerdina M, Assareh Zadegan M A. Prevalence of hepatitis C virus (HCV) among thalassemia patients in Khuzestan province, southwest Iran. Pak J Med Sci. 2009; 25(1):109-113.
15. Al-Mahroos FT, Ebrahim A. Prevalence of hepatitis B, hepatitis C and human immune deficiency virus markers among patients with hereditary hemolytic anaemias. Ann Trop Med. 1995; 15(2):121-128.
16. Al-Kubaisy WA, Al-Naib KT, Habib MA. Seroprevalence of hepatitis C virus specific antibodies among Iraqi children with thalassemia. East Mediterr Health J. 2006; 12(1-2):204-210.
17. Soldan K, Ramsay M, Collins M. Acute Hepatitis B Infection Associated with Blood Transfusion in England and Wales, 1991-7: Review of Database. BMJ. 1999; 318: 95.
18. Hussain IH, Iqbal R, Hussain Khan M, Iftekhar B, Aziz B, Burki FK, Sethi J, Hassan M, Nisar Y. Prevalence of hepatitis C in beta thalassemia major. Gomal Journal of Medical Sciences. 2008; 6(2):88-90.
19. Ataei B, Hashemipour M, Kassaian N, Hassannejad R, Nokhodian Z, Adibi P. Prevalence of Anti HCV Infection in Patients with Beta-Thalassemia in Isfahan-Iran International Journal of Preventive Medicine. 2012; 5:118-123.

20. Shaker O, Ahmed A, Satar I, El Ahl H, Shousha W, Doss W. Occult hepatitis B in Egyptian thalassemic children. J Infect Dev Ctries. 2012; 6(4):340-346.

21. Bhavsar H, Patel K, Vegad M, Madan M, Pandey A, Asthana A, Mistry K. Prevalence of HIV, Hepatitis B and Hepatitis C infection in Thalassemia major patients in tertiary care hospital, Gujarat. NJIRM. 2011; 2(3): 47-51.

22. Charan VD, Nanu A, Desai N, Choudhry VP. HIV infection in multitransfused thalassemic children. Indian Pediatr. 1993; 30: 1232-1233.

23. Dubey AP, Choudhry P, Puri RK. Comments: HIV serosurveillance in multitransfused thalassaemic children. Indian Pediatr. 1993; 30: 109.

24. Makroo R N, Arora JS, Chowdhry M, Bhatia A, Thakur U K, Minimol A. Red cell alloimmunization and infectious marker status (human immunodeficiency virus, hepatitis B virus and hepatitis C virus) in multiply transfused thalassemia patients of North India. 2013, 56(4):378-383.

25. Tamaddoni A, Mohammadzadeh I, Ziaei O. Seroprevalence of HCV Antibody among Patients with β-Thalassemia Major in Amirkola Thalassemia Center, Iran. Iran J Allergy Asthma Immunol. 2007; 6(1): 41.

26. Ansari S H, Shamsi T S, Tahir Khan M, Perveen K, Farzana T, Erum S and Ansari I. Seropositivity of Hepatitis C, Hepatitis B and HIV in Chronically Transfused ββ-Thalassaemia Major Patients. Journal of the College of Physicians and Surgeons Pakistan. 2012; 22 (9): 610-611.