

Seroepidemiology of Human T-cell Lymphotropic Virus 1 Infection in Hemodialysis Patients

Should We be Concerned About it?

Javad Ghaffari,¹ Mahbobeh Ebrahimi,² Atieh Makhloogh,³ Hamid Mohammadjafari,⁴ Zeinab Nazari⁵

¹Department of Immunology, Mazandaran University of Medical Sciences, Sari, Iran

²Molecular and Cellular Biology Research Center, Faculty of Medicine Mazandaran University of Medical Sciences, Sari, Iran

³Division of Nephrology, Department of Internal Medicine, Mazandaran University of Medical Sciences, Sari, Iran

⁴Division of Pediatric Nephrology, Department of Pediatrics, Mazandaran University of Medical Sciences, Sari, Iran

⁵Departments of Oncology and Gynecology, Mazandaran University of Medical Sciences, Sari, Iran

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Human T-cell lymphotropic virus 1 (HTLV1) is a lymphotropic virus which can be transmitted through unprotected sexual activity, breast feeding, and blood transfusion. Although most of HTLV1-infected individuals remain asymptomatic carriers, 1% to 5% and 3% to 5% develop adult T-cell leukemia and HTLV1-associated myelopathy/tropical spastic paraparesis, respectively. The aim of this study was to determine the prevalence of HTLV1 infection in hemodialysis patients in Sari and Ghaemshahr. This cross-sectional study was conducted on 160 patients using random samples selection, and included 80 men and 80 women (mean age, 59.1 ± 14.7 years). All the samples were screened for HTLV1 antibody by enzyme-linked immunosorbent assay and positive samples were confirmed by Western blot assay. Only 1 patient had a positive anti-HTLV1 enzyme-linked immunosorbent assay test, which was confirmed by Western blot. The overall prevalence of HTLV1 seropositivity was 0.6%. The patient was a 21-year-old woman with a history of multiple blood transfusions. She had a history of unsuccessful kidney transplantation and had been on hemodialysis before transplant, too. This study suggests that HTLV1 infection may not be prevalent in high-risk patients in Mazandaran province, and there is no need for HTLV1 screening of blood samples.

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INTRODUCTION

Human T cell lymphotropic virus 1 (HTLV1) is a member of retroviruses family of *Oncovirinae*. The infectious cause is human and is one of the main causes of lymphoma, T-cell adult leukemia HTLV1-dependent myelopathy, and several clinical syndromes, such as subsided immune system disorders, cutaneous pulmonary opportunistic infections (eg, *Strongyloides stercoralis*), and malignancy in other organs.¹⁻³ The virus is transmitted through infected blood cell by recurrent blood transfusion, sexual transmission, and breast feeding. Less than 3% to 5% of HTLV1-infected

individuals develop HTLV1-associated myelopathy/tropical spastic paraparesis or adult T-cell leukemia, and the majority remain asymptomatic carriers throughout their lives.⁴ Seroepidemiologic assessments have shown that about 15 to 20 million people in the world today are estimated to be infected by HTLV1.⁵ This virus is endemic in Latin America, Caribbean Sea, south and center of Africa, and Japan.⁶ It has been shown that north east of Iran has been recognized as a new endemic region of the virus and the prevalence of HTLV1 infection in Mashhad and Sabzevar cities is 2.2% and 1.6, respectively.⁷⁻⁹ We have previously reported that

in north of Iran, Mazandaran province is not an endemic region of the virus.¹⁰

Patients receiving hemodialysis are one of the high-risk groups for HTLV1 infection due to their requirement for blood transfusion.¹¹⁻¹³ According to the previous studies, a considerable proportion of its transmission is through infected blood products.¹⁴ The aim of this study was to investigate the seroepidemiologic status of HTLV1 in hemodialysis patients in Mazandaran province, north of Iran.

MATERIALS AND METHODS

This study included 160 patients who attended to the hemodialysis unit of Imam Khomeini and Fatemeh Alzahra Hospitals in Sari and Razi Hospital in Ghaemshahr, Mazandaran University of Medical Sciences, between April and July 2011. The study was approved by the Ethics Committee of Mazandaran University of Medical Sciences, and informed consent was taken from each patient. Five millilitres of blood sample was drawn from each patient and serum was separated and kept in -20°C. A detailed data collection form was filled out for each individual simultaneous to gathering blood samples.

All sera were screened for HTLV1 antibody by enzyme-linked immunosorbent assay commercial kit according to manufacturer's instruction (Dia Pro Diagnostic Bioprobes, Milan, Italy). To confirm the HTLV1 infection, the Western Blot method was used on all reactive samples (Gene Lab Diagnostic Ltd, Singapore).

RESULTS AND DISCUSSION

In this study, 160 patients (80 women and 80 men) with the mean age of 59.1 ± 14.7 years (range, 17 to 93 years), who were admitted at the hemodialysis units, were selected. Table 1 shows the age distribution of the study population. Among the participants, 103 (64.4%) had a history of blood transfusion (65% of men and 63.8% of women) and all of them had a history of minor surgeries (fistula and catheter insertion) at least one time. None of the patients had a history of high-risk sexual behavior or a history of human immunodeficiency virus infection or intravenous drug injection. Most of the patients were married (93.1%). A history of diabetes mellitus, positive hepatitis C virus, and positive hepatitis B virus

Table 1. Age Distribution in the Study Population

Age, y	Male (%)	Female (%)
< 20	0	1 (1.2)
20 to 40	8 (10.0)	10 (12.5)
40 to 60	27 (33.9)	25 (31.2)
60 to 80	41 (51.2)	38 (47.5)
> 80	4 (5.0)	6 (7.5)
All	80 (100)	80 (100)

were detected in 32.5%, 3.8% and 2.5% of the patients, respectively (Table 2).

In the primary screening by enzyme-linked immunosorbent assay and subsequent Western blot confirmation, only 1 case was found to be positive for HTLV1 (0.6%). The patient was a 21-year-old woman known as a case of end-stage renal disease due to glomerulonephritis who was under dialysis. This patient had a history of transplantation 3 years ago, which was not successful due to graft rejection. Furthermore, the patient had a history of arteriovenous fistula placement. She also had a history of several blood transfusion and negative results for hepatitis B and C viruses and human immunodeficiency virus infections.

Our results showed that the prevalence of HTLV1 in patients on hemodialysis is low (0.6%). Previous studies demonstrated that north east of Iran is a new endemic region of HTLV1 infection.⁷⁻⁹ Therefore, all blood products are routinely screened for this infection in Razavi province.¹⁵ In other investigations, the prevalence rate of HTLV1 infection in the general population and blood donors varies between provinces such as West Azarbayjan (0.34%), Bushehr (0.13%), and Chaharmahal and Bakhtiari (0.62%).¹⁶ Studies in different parts of Iran have shown that HTLV1 infection rate is relatively high among high-risk groups, including patients with thalassemia, end-

Table 2. Underlying Diseases by Sex

Disease	Male (%)	Female (%)	All (%)
Diabetes mellitus	12 (15.0)	13 (16.2)	25 (15.6)
Hypertension	37 (46.2)	33 (41.2)	70 (43.8)
Diabetes and hypertension	10 (12.5)	17 (21.2)	27 (16.9)
Lupus	1 (1.2)	2 (2.5)	3 (1.9)
Nephrotic syndrome	0	2 (2.5)	2 (1.2)
Unknown	12 (15.0)	11 (13.8)	23 (14.4)
Cancer	1 (1.2)	0	1 (0.6)
Urinary infection	4 (5.0)	2 (2.5)	6 (3.8)
Polycystic kidney disease	3 (3.8)	0	3 (1.9)
Total	80 (100)	80 (100)	160 (100)

stage renal disease, and hemophilia.^{11-13,17-19} Thus, it is necessary to screen the HTLV1 antibody in blood products. Consistence with this study, Ghaffari and colleagues found in their assessment of 1200 patients with various diseases over Mazandaran province a prevalence rate of 0.085% for HTLV1 infection. This implies that Mazandaran province is not an endemic region comparatively to Northeast regions of the country.¹⁰

One study in Jamaica on 63 patients on hemodialysis revealed that organ transplantation is one of the risk factors for HTLV1 transmission.²⁰ In Japan, which is an endemic region for HTLV1 infection, the prevalence of HTLV1 in kidney transplanted patients have been reported to be 8.3% to 9.9%.²¹ In another study from Urmia, north west of Iran (which is not an endemic region), the prevalence rate of HTLV1 infection in 91 transplant patients was 1.09%, which is lower than its prevalence rate among hemodialysis patients in this city.²² Thus, although organ transplantation is a risk factor for the virus transmission, it seems that HTLV1 is not considered as a blood-borne disease in nonendemic areas, such as Mazandaran province. We have reported (article in press) that the prevalence of HTLV1 infection is not high in patients with major thalassemia (1.4%) compared with other parts of Iran such as Golestan province (4.4%) and Tehran province (3.6%).^{11,16}

In conclusion, the present study showed that despite the multiple blood transfusions in hemodialysis patients in Mazandaran province, the prevalence rate of this virus is low in this region, and there is no need for HTLV1 screening of blood products.

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CONFLICT OF INTEREST

None declared.

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Correspondence to:
Atieh Makhlough, MD
Division of Nephrology, Mazandaran University of Medical Sciences, Sari, Iran
Fax: +98 151 223 4506
E-mail: makhlough_a@yahoo.com

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