Iranian Journal of Virology 2014;8(2,3): 44-8
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Original Article

The seroprevalence of HTLV-1 in Neyshabour City, Northeast of Iran, during 2008-2009

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Abstract

Background and Aims: HTLV-1 is widespread worldwide and endemic in some areas such as Northeastern Iran. The present study aimed to determine the prevalence of HTLV-1 among individuals in Neyshabour City during the years of 2008-2009.

Materials and Methods: A total of 254 blood specimens were collected from participants in the great medical diagnostic laboratory of Neyshabur, Northeast Iran. Travelers to the city were excluded from this study. History of each patient was also assessed for the possible existence of virus before test and meanwhile each of patient's consent of inclusion was prepared. The history of patients syringe transfusion condition and literacy level of them was also prepared. From each individual, 5 ml of blood sample was collected. Serum samples were prepared through centrifugation and stored at -20°C. Sera samples were tested screened for the presence of specific anti- HTLV antibodies against HTLV-1 by the Enzyme-linked Immuno-sorbent Assay (ELISA) test (Dia.pro diagnostic bioprobes corporation, Italy) according to the manufacturer's instructions.

Results: HTLV-1 infection was positive in 5.5% (14/254) of the participants according to the results of ELISA test. The prevalence of total HTLV-1 in each year of 208 and 2009 was 6.2%, 5.1%, respectively. The individuals with more than 40 years had a higher rate of infection (10% and upper).

Conclusion: The HTLV-1 infection was detected at a high rate in individual's blood donors in Neyshabur city during 2008-2009. The rate of infections showed a decrease state from far to the recent years.

Keywords: HTLV-1, Neyshabur, ELISA

Introduction

Human T-lymphotropic virus (including common HTLV-1 and HTLV-2) belong to the reteroviridae family (1-3). The virus prevalence is widespread all over the world and is endemic in several regions; such as North parts of Iran (4-6). According to published previous studies, the rate of infection have been less than 0.26% in Mashhad North Eest of Iran. However, it does not exceed more than 0.34% in several other areas of the country (7). The transcontinental subgroup (TC) is the predominant HTL-V in Iran and other Middle Eastern countries (8). Among other countries such as Turkmenistan, Brazil, Spain, Korea and Japan the prevalence was 0.007 (9), 1.9 (10), 0.001 (11) , 0.27 (12), and 0.12% (13), respectively . The HTLV-1 causes a lympho-proliferative malignancy of CD4 positive cells in adults (T-cell leukaemia/lymphoma or ATL) and a chronic myelopathy called tropical spastic

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[DOI: 10.21859/isv.8.2.3.44]

paraparesis/HTLV-1-associated myelopathy (TSP/HAM) (14, 15). HTLV-2 has 70% similarity with HTLV-1 genomic structure (16). Carriers of HTLV-1 and HTLV-2 infect in prolonged time asymptomatically (17). As HTLVs are mostly transmitted through blood transfusion, the screening for antibodies and discarding seropositive units must efficiently prevent this transmission (18). The transmission routes of these reteroviruses vary and include: vertical; mostly from mother to child (through infected milk lymphocytes) (19), by cellular blood products transfusion (20), by sharing contaminated needles and sexual contact (bi-directional but higher from male to female) (21) and also rarely through liver, kidney, and lung transplants (22). The aim of the present survey was determination of prevalence of HTLV-1 and 2 among healthy individuals attending a great medical diagnostic laboratory in Neyshabour, Northeast of Iran during the years of 2010-2014.

Methods

Study population

A total of 254 blood samples were obtained from participants that were gone to the great medical diagnostic laboratory in Neyshabur Northeast Iran (each was stored in -20C). Travelers to the city were not included in the study. History of each patient was also gained for the possible existence of virus before test and likewise all the patients consent was prepared. In addition, the history of syringe transfusion and literacy of patients were also prepared.

Serological assay and confirmation tests

From each individual 5 ml of blood was gathered. Sera samples were prepared through centrifugation and stored at -20°C. Sera samples were sreened for the presence of specific antibodies against HTLV-1 and HTLV-2 by the Enzyme-linked Immuno-sorbent Assay (ELISA) test (Dia.pro diagnostic bioprobes, Italy) according to the manufacturer's instructions.

Statistical analysis

All descriptive data were normalized as the mean, standard deviation and each percent. The SPSS software (version 20, copyright IBM Crop. 1989, 2011 (© was applied for the data analysis using Chi Square and t-test. the variables I in this study were the equation age and sex of patients. The p value of <0.05 was considered statistically significant.

Results

The population that was studied here, consisted of 254 individuals that ranged in age from 1 to 90 years old. Thirty-five of them were males (14%) and 221 (86%) were females. The mean age of males and females were 44±3 and 53±3, years respectively. The distribution of patients based on the age and sex has been depicted in table 1. Total of repeatedly reaction against HTLV-1 specific antibodies was observed in 7% (18/254) of the participants in the ELISA test. Because of no previous syringe or blood transfusion among positive patients, no relationship found regarding this route of

Table 1: The age and sex distribution of patients and total positive cases of HTLV1.

Variable		No.	Positive cases (%)	Odd Ratio (OR)	OR95%CI	P value
Age (years)	0-19	29	13(3.03)	Baseline		<0.0001
	20-29	66	49(1.92)	0.625 1.459	0.336-1.163 0.807-2.637	
	30-39	18	88(4.36)	4.512	2.571-7.918	
	≥40	71	17(12.36)			
Sex	Male	35	3(8.6)	1.386	1.128-1.704	0.002
	Female	221	16(6.3)			

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[DOI: 10.21859/isv.8.2.3.44]

transmission. As shown, the age ranges of 30-39 and upper than 40 years old demonstrated more positive results. The prevalence of total HTLV-1 in each year included 19 cases in 2008 and 16 in 2009 respectively.

Discussion

Several previous studies from Northeast Iran have revealed that the both HTLV-1 and HTLV-2 were endemic in this area (23). However, the rate of sero-positivity of HTLV-1 has decreased gradually since 1996 to date from 1.97% to lower than 0.5% (24-26). Similarly, the results of the current study showed that the prevalence of HTLV-1 has decreased in Neyshabur since 2008 to 2009. In a survey in Mashhad in 2012, the rate of HTLV was 0.47% (27). Moreover, in a previous study by Safabakhsh, the sero-prevalence of HTLV-1 not exceeded than 0.19% (7). The main reasons for the declining rate of HTLV-1 possibly include: improvement of donor selection in the Blood Transfusion and awareness increasing among blood donors. However, in Rafatpanah's study in Mashhad, although the prevalence of HTLV-1 was 20% (10 positive samples), no evidence of HTLV-II infection was determined among immonoblot samples together with Nested-PCR (28). However, in the present study more than 5% of healthy individuals were positive for HTLV-1 each year. To the best of our knowledge, the published data regarding HTLV-2 prevalence is not clear in Iran. In a study by Durojaiye in Nigeria, the sero-prevalence of HTLV-1 was 0.5% among healthy blood donors (29). Reportedly, the sero-prevalence of HTLV-1 has been very low in North Ameriac and Europe, for example 0.01-0.03% in USA and Canada (30, 31), 0.002% in Norway and 0.0056% in Greece (32). In the present survey, none of individuals had a history of previous transfusion and we could not find any relationship in this regard. There was a higher rate of positive HTLV1 samples in the current investigation in comparison to some other studies from the country. The presumed reasons are possibly a more endemic region of study and the use of more careful techniques such as western blott analysis and Plymerase chain reaction (PCR) in some of those studies. Furthermore, in this study the age group of upper 40 years had a higher prevalence of HTLV-1, suggesting a higher carrier state for the virus. The results depicted that the both HTLV-1 is present in Neyshabur city, Northeast of Iran and the seroepidemiology of the agent is decreasing similar to other previous studies from other Northern cities.

Conclusion

In this study the HTLV-1 was positive with a high prevalence among blood donors individuals of Neyshabur city in each year from 2008-2009. The prevalence of HTLV-1 was higher than previous in all the years of this study than other cities.

Acknowledgement

The authors thank the staffs of Mashhad-ACECR laboratory in Neyshabour for their kindly cooperation.

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