

ORIGINAL ARTICLE

SEROLOGIC PREVALENCE OF HTLV AMONG BLOOD DONORS IN MASHHAD (NORTHEASTERN IRAN)

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Abstract

Background-HTLV is a lymphotropic virus which can contribute to carcinogenesis in adult T-cell leukemia. The prevalence of this virus in Northeastern Iran has led us to investigate more accurately its serologic prevalence.

Methods-A total of 229,037 blood donors were studied during a 4-year period by using Micro-ELISA and Western Blot (WB) assays. Positive results in both tests were considered and Cases with ambiguous results were checked by PCR.

Results-Among all the blood donors under study, 2,634 cases were HTLV positive. The elimination of repeated donation resulted in the identification of 2,167 blood donors who actually carried the virus in their blood. The male to female ratio was 3:1 and the total prevalence of this virus was found to be 1.16% [CI_{95%}=1.11%-1.21%].

Discussion-As one fifth of cases infected with this virus had donated blood more than once in this study, it would be better if a system was implemented to recognize these subjects and to prevent them from further donations. All blood donations must be accurately studied for the presence of HTLV.

Keywords • HTLV • blood transfusion • donor

Introduction

In 1980, the human T-cell lymphotropic virus type-1 (HTLV-I) was detected in a patient with dermal T-cell lymphoma in Japan. Later, it was found that his disease was not lymphoma and thus the virus was named Adult T-cell Leukemia Virus (ATLV). This virus, which infects T-cell, is easily transmitted via blood cell products such as whole blood, packed cells, and platelets. However, infection has not been reported in patients who received plasma.¹⁻³

In endemic areas, in which HTLV is common, seroconversion has been observed in 44%-63% of cases after receiving blood contaminated with HTLV-I infected cells.² In rare cases, adult T-cell leukemia has been observed after receiving this virus.

Contamination of the blood with HTLV-I has been reported to be 0.016-0.1% in the United States, 0.3% in Brazil, 0.7% in Nigeria.⁶⁻⁹ In a study conducted in Iran, HTLV-I was isolated from four patient with ATL, one patient with TSP/HAM and one with T-cell lymphoma.^{4,5} In the United States, HTLV type II was seen in 60% of cases which was mostly related to intravenous drug abusers.⁷

In other studies, the presence of HTLV-I was reported in Khorasan province.^{4,5} As there is an increased risk of cancer due to this virus, we decided to estimate the serologic prevalence of this virus among blood donors in Mashhad.

Materials and Methods

In order to determine the prevalence of HTLV infected cases, all the blood donated to the Blood Transfusion Organization in Mashhad (northeastern Iran) in a 4-year period were studied.

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A total of 229,037 blood donations were studied, all of which were primarily assessed by the Microelisa assay (Vironostika HTLV I, II Organon). All positive cases were re-assessed by HTLV blot_{2/4} Western Blot assay (GeneLabs Diagnostics). Specimens with borderline results were assessed by the PCR method.

As a person may donate blood more than once in a 4-year period, a system was implemented to eliminate repeated cases. A random sample with 4,085 specimens was chosen and the first three letters of their names were noted. All cases with repetition of these first three letters were eliminated from the study (756 cases). In this way, it was estimated that around 18.51% of cases have donated blood more than once. By subtracting the number of repeated cases from the total number of blood donors, it was seen that around 184,496 individuals actually participated in this study.

Results

A total of 2,634 specimens were found to be positive by the Elisa and WB assays. However, after eliminating the repeated specimens and those who had donated blood more than once, it was seen that 2,167 cases were HTLV positive. Therefore the prevalence of HTLV contamination is estimated to be around 1.16% (with 95% confidence interval between 1.11% and 1.21%). Also, 1,594 persons were male and the remaining 575 were female with an age range of 18-65 years. Twenty persons (0.9%) were below 20 years of age and 92.48% of women and 81.16% of men were married.

In this study, the serologic prevalence of HTLV I and HTLV II was 70.92% and 0.07% respectively. Also the WB assay was found to be borderline in 318 cases (11.69%) and negative in 297 cases (10.92%). Most HTLV positive cases were aged between 20-40 years. The prevalence of serology positive cases without the elimination of repetitious donations showed a similar prevalence (1.15%) compared to the first method in which the multiple donations were eliminated.

Discussion

Assessment of the prevalence of HTLV is important because the prevalence of this virus is considerable (around 1%) in endemic areas and there is a probability of its transmission via

transfusion which could in some cases result in malignancies. In Khorasan province, in which this virus is known to be endemic, it is necessary that all blood specimens be studied by the Elisa and WB assays. By the recognition of serologic positive cases, the transmission of this virus to other people must be prevented.

Although PCR is the most accurate method for confirming the presence of HTLV^{10,11}, it is not applicable to all cases due to its high costs and unavailability. Thus, it is better that this method be used just for the borderline cases. The serologic prevalence of HTLV shows a higher value in Iran as compared to values reported by other countries. Moreover, the ratio between type I to type II HTLV is higher in Iran as compared to other countries.

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