

The Enigma of Human T-Cell Leukemia Virus Type-1 (HTLV-1) Infection in Iran

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Abstract

Human T-cell lymphotropic virus type-I (HTLV-I) was the first human retrovirus associated with malignancy. The prevalence of HTLV-I infection varies significantly in different regions of the world. In this study, the prevalence of HTLV-I infection among ethnic Jews living in Shiraz, South of Iran, was investigated.

286 blood samples were obtained. HTLV-1 antibody assay on serum samples was done by standard ELISA method. Western blot method was applied for confirmation of borderline results.

None of the subjects was found HTLV-I seropositive using both ELISA and western blotting methods.

Our preliminary results indicate that HTLV-I is not endemic in Jewish people living in Shiraz, the southwest of Iran.

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Keywords • HTLV-1 • Iran • Shiraz • Infection • Virus

Introduction

Human T-cell lymphotropic virus type-I (HTLV-I) was the first human retrovirus associated with malignancy. In 1980, the virus was isolated from patients diagnosed as cutaneous T-cell lymphoma.¹ These patients proved to have adult-T-cell leukemia/lymphoma (ATL). HTLV-I infection has a much broader spectrum of clinical manifestations, including HTLV-I-associated myelopathy/tropical spastic paraparesis (HAM/TSP), T-cell leukemia, B-cell lymphoma, polyarthritis, uveitis and infectious dermatitis.^{2,3} The prevalence of HTLV-I infection varies significantly in different regions of the world. The infection is endemic in southern Japan, the Caribbean, parts of Africa and the Middle East.^{4,5}

Tabei and colleagues⁶ reported the first case of adult-T-cell leukemia/lymphoma with hypercalcemia from Iran. Later it was shown that HTLV-I infection was endemic in both Muslim and Jewish population of Mashhad, northeast of Iran.^{7,8}

In 1990, HTLV-I carriers have been identified among immigrants from endemic areas of Iran residing in Israel, the so-called Mashhadi Jews.⁹ Recently, in one study, 1.2% of thalassemic patients, residing in Shiraz, southwest of Iran were found to be seropositive for HTLV-I infection.¹⁰ Miller et al¹¹ also reported that 2% of non-Mashhadi Iranian Jews, i.e. Shirazi, were seropositive for HTLV-I.

Therefore, it remains unclear whether Mashhad is the only town in Iran where HTLV-I infection is endemic. This study was designed to determine whether HTLV-I infection was also endemic among Shirazi Jews ethnic group living southwest of Iran.

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The study population comprised 286 healthy Jewish volunteers resident in Shiraz, southwest of Iran. Of them, 153 (53.5%) were male and 133 (46.5%) were female aged between 10 to 80 years. Informed consent was obtained from all participants.

Two hundreds and eighty six blood samples were taken by venipuncture from the subjects and the sera were isolated by centrifugation. All the sera were frozen at -20°C until use.

HTLV-1 antibody assay on serum samples was done by standard ELISA method (Vironostica Organon Teknica, Italy). Western blot method was implemented for confirmation of some borderline results.

HTLV-I infections are more frequent in Jewish population of Mashhad, in the northeast of Iran. The prevalence of HTLV-I infection in other parts of Iran is still unknown. The presence of HTLV-1 antibodies is an important factor in establishing the diagnosis of infection. Two previous studies have shown that HTLV-I infections may be endemic in Shiraz.^{10,11} It has been reported that HTLV-I infection is present in 2% of Iranian Jews originating from Shiraz¹⁰ and in 1.2% of thalassemic patients. However, in both studies the source of infection has not been determined. Blood transfusion is the major route of HTLV-I transmission in thalassemic patient. Since in Iran, determination of HTLV-I antibodies is not part of the routine laboratory test in all blood transfusion centers, repeated blood transfusion in thalassemic patients may increase the risk of virus transmission from infected blood. Furthermore, it is possible that following transfusion the levels of anti-HTLV-I antibody titer increases in serum sample of the patients. Miller et al¹¹ on the other hand, have not mentioned whether two HTLV-I seropositive Shirazi Jewish subjects might have resided in Khorasan province, the northeast of Iran or whether they had been married with individuals from this part of country. However, in our study, none of 286 Shirazi Jewish subjects was found to be HTLV-I seropositive. In one study 29/632 (4.5%) of thalassemic patients and 7/236 of hemophilic patients who were admitted to different hospitals in Tehran, were found to be seropositive for HTLV-I antibodies (unpublished data). Also in this study the origin of HTLV-I infection was not determined. A previous study on 15866 serum samples of blood donors from 20 largest cities of Iran in different geographical regions has shown that Mashhad in the northeast of Iran had higher prevalence of HTLV-I infection (2%).¹² Only 3/2000 (0.15%) of Shirazi subjects were found seropositive for HTLV-I antibody in the same study. Our results reveal that HTLV-I is not endemic among Jewish people living in Shiraz, southwest of Iran.

Both HTLV-I and adult T-cell leukemia/lymphoma have been shown to be endemic in some regions of the world. Detection of 13 cases of ATL in northeastern Iran with HTLV-1 seropositive confirms that this region in Iran is an endemic area for HTLV-I Infection.¹³ HTLV-I has been linked to other diseases such as tropical spastic paraparesis (TSP), HTLV-I-associated myelopathy (HAM), mediterranean lymphoma and possibly gastrointestinal lymphoma. All evidence suggest that this virus is endemic in certain areas of Iran and has a low tendency to spread. This is most likely due to its very low infectivity or the mode/route of infection. Therefore, in order to determine the epidemiological association of HTLV-I with mentioned diseases in different geographical regions of Iran, more study population including patients with definitive diagnosis of adult T-cell leukemia, HAM/TSP or some other HTLV-I related disease should be further investigated in future studies.

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