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# DETECTION OF HUMAN T-CELL LEUKEMIA VIRUS CARRIERS IN THALASSEMIA PATIENTS IN SHIRAZ: A BRIEF REPORT

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**ABSTRACT** *The presence of human T-cell leukemia virus (HTLV-I) carriers in Fars province, southern Iran, was investigated. The sera of 160 randomly selected thalassemia patients, a well-known high-risk group for transfusion-associated viral infections, were screened for detection of antibodies to HTLV-I by the enzyme-linked immunosorbent assay method (ELISA), positive results were confirmed by Western blot (WB) analysis. Patients were ages 6 to 24 years, from Shiraz and nearby cities. Four patients were found to be seropositive.*
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**Keywords** • HTLV-I • thalassemia • transfusion • Iran

## Introduction

The human T-cell lymphotropic virus type I (HTLV-I) is the first isolated human retrovirus.[2,3,18] This virus is strongly believed to be the causative agent of adult T-cell leukemia/lymphoma and some neurological disorders in the human being.[7,13,15,18,19] HTLV-I infection occurs worldwide but tends to be geographically restricted or clustered.[3] Transfusion of blood and its different components is reported to be one of the major routes of transmission in endemic and non-endemic areas.[2,3,7] High-risk groups such as patients with hemophilia are reported to be in great danger of virus transmission.[17] We intended to demonstrate the possibility of the presence of HTLV-I carriers by detecting seropositive high-risk patients in our region.

## Materials and Methods

### Case History

One-hundred and sixty cases aged 6 to 24 years were randomly selected among the patients with thalassemia major, referring for their regular blood transfusion. Three to four ml blood sample was collected from each patient before starting the transfusion.

According to the results obtained by the ELISA method, the sera of 5 out of 160 thalassemia patients showed definite reactivity to HTLV-I antibodies in two repeated assays (Fig. 1) four of which were confirmed by Western blotting (WB) analysis. None of the patients showed any sign or symptoms of HTLV-I associated diseases. The ages of these four patients ranged 9-15 years. Each had received more than 90 blood transfusions.

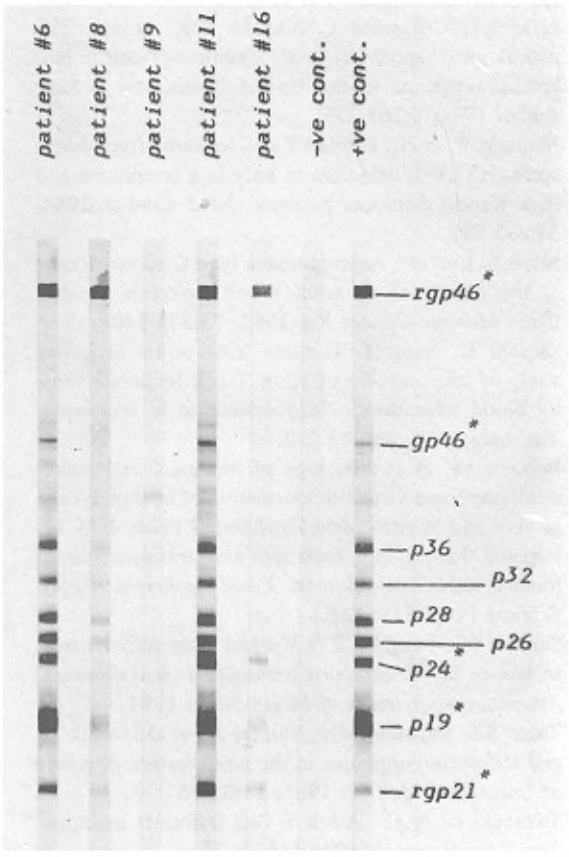


Figure 1. Western blotting results in the five seropositive patients by the ELISA method.

## Discussion

The human T-cell leukemia/lymphoma virus type I (HTLV-I) was the first human retrovirus to be isolated by Gallow in 1978.[2,3,18] The vast majority of HTLV-I infected cells derived from patients or obtained from *in-vitro* experimental infection of blood cells are shown to be T4 lymphocytes.[11,12] The virus is responsible for the malignant transformation of the target cells.[2] The HTLV-I is strongly believed to be the causative agent of the adult T-cell leukemia/lymphoma (ATL),[7,15] tropical spastic paraparesis[18,19] and the HTLV-I associated myelopathy.[13] Many studies have shown that healthy individuals with anti-HTLV-I antibodies in their sera are carriers and are responsible for the virus transmission.[4,9]

HTLV-I is an old primate virus, is believed to have originated in Africa, and transferred to other parts of the world by the slave trade and migration of people.[3] Today, the HTLV-I infection occurs worldwide but tends to be geographically more prominent in certain parts of the world such as the Caribbean Islands and southwestern Japan.[3,6] Many cases are reported from Italy,[8] Spain,[5] the United States and Western Europe. Most of these cases are attributed to intravenous drug abuse or blood transfusion.[2,3,7,10] Cases of HTLV-I associated ATL have also been reported from the northeastern province of Iran.[1,14,21]

Transfusion of contaminated blood and its components is the major route of virus transmission in endemic and non-endemic regions.[2,3,7] Studies in the United States have identified 2.5 per 10,000 healthy voluntary donors as positive for HTLV-I antibody by ELISA and confirmatory tests.[20] Patients requiring repeated transfusions are certainly of a greater risk of transfusion-associated HTLV-I infection. In a study of a series of 50 Japanese patients with hemophilia, two carriers of the virus were detected.[17]

In our study, we investigated the presence of HTLV-I antibodies in the sera of 160 thalassemia patients, a well-known risk group for transfusion-associated viral infections. In this manner, we intended to indirectly demonstrate the possibility of the presence of virus carriers among the blood donors in our region. The initial screening of the sera by the ELISA method detected five patients suspected to be virus carriers. The confirmatory Western blot technique proved four of them to be true virus carriers and showed one false-positive ELISA result (Fig. 1). Considering the age of the 160 thalassemia patients, the age at the first blood transfusion and the average number of required transfusions per month, a total number of 17,600 transfusions were estimated to have been given in these patients. If we do not consider the possibility of multiple blood donations

by a voluntary donor, this pilot study indicates the necessity for investigating at least 4,400 blood donors for the likelihood of detecting one virus carrier. This figure indicates the possibility of presence of 2.3 carriers per 10,000 donors, a figure near that obtained in the United States.[20] However, a large-scale sero-epidemiological study of blood donors (and possibly the general population in our region) is needed to investigate the accuracy of this estimation. We believe that such a study may include southern Iran as a new geographical region potentially endemic for the HTLV-I infection. □

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