

SEROEPIDEMIOLOGICAL PREVALENCE OF HUMAN T-CELL LYMPHOTROPIC VIRUS TYPE I (HTLV-I) AMONG HEALTHY BLOOD DONORS IN EASTERN SAUDI ARABIA

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Human T-cell lymphotropic virus type I (HTLV-I) has been linked with adult T-cell leukemia/lymphoma (ATLL), tropical spastic paraparesis (TSP), HTLV-I-associated myopathy (HAM), and polymyositis.^{1,2} HTLV-I antibodies are found with high frequency (48%) in persons affected with these disorders, and an association between HTLV-I antibodies and Norwegian scabies has been demonstrated.³ However, the HTLV-I antibody prevalence varies between <2% to >18% among apparently healthy subjects.^{1,2} Previous studies give the prevalence rates of the HTLV-I antibody as 0.018%-0.043% in the US, 0.01% in France, 3.0% in Japan, 1.5% in Trinidad, 1.2% in Senegal and 0.7%-3.6% in Nigeria.¹⁻⁵

It is now well documented that HTLV-I is transmitted mainly through transfusion of infected blood and cellular blood products, intravenous drug abuse, perinatally and sexually.^{3,6} Though HTLV-I is remotely related to human immunodeficiency virus (HIV), with no cross-reactivity between them, the extent of the immunomodulatory effect of HTLV-I on HIV-infected persons is still a major unresolved problem,⁷⁻⁹ though some authors have claimed that HTLV-I could accelerate the HIV disease progress to AIDS.^{10,11} However, HTLV-I is more closely related to HTLV-II and both viruses are cross-reactive.^{3,12,13}

The aim of this study is to document the prevalence of HTLV-I in Saudi Arabia, which has also included HTLV-II detection among the different parameters for which blood donors are screened.

Materials and Methods

We collected 40,013 blood specimens from apparently healthy blood donors from July 1995 to December 1997. The Dammam Regional Laboratory and Blood Bank is the regional reference laboratory for supervising the blood bank services in the Eastern Province of Saudi Arabia, and all the donors were residents of this area. All the subjects

were adults, with a mean age of 34 years. Of the 40,013 samples, 33,908 were from Saudis, 2065 from other Middle Eastern nationals, 2875 Asians and 1165 from other nationalities. All the serum specimens were either tested on the day of collection, or kept frozen at -20°C and thawed before being tested. The screening test kits used were the Human T-cell Lymphotropic Virus Types I/II, Abbott's EIA kits, by Abbott Laboratories, and the ELISA machine was the Abbott Commander Machine: Flexible Pipetting Center, Parallel Processing Center, and the Dynamic Incubator. Confirmatory tests were performed on HTLV Blot 2.3 kits by Diagnostic Biotechnology (Pte) Ltd., a subdivision of Genlabs Technologies (USA) in Singapore.

All the repeatedly reactive specimens by the ELISA technology were re-tested by the Blot technique. We reported as positive HTLV-I for the specimen reactive to gag P19 or P24, env gp 46 or r-46-1 and r-gp 21, while any band present which did not meet the former criteria for positive HTLV-I was taken as an indeterminate specimen. The specimens which were nonreactive to any HTLV-I-specific bands were considered negative for HTLV-I. All the methodology and techniques used in the testing were in full compliance with the recommendations of the kits' manufacturers. Since our focus in this paper is on HTLV-I, we have not reported any HTLV-II or dual infections of HTLV-I/II.

Results

Of the 40,013 specimens, we found 24 repeatedly reactive specimens (0.059%) by ELISA screening assays. These 24 specimens showed the following results by the blotting confirmatory tests: 9 specimens (0.059%) were positive, all from Saudi citizens, 4 were indeterminate (0.009%), and 11 were reported as negative to HTLV-I. The figures give a total prevalence rate of 0.022% for HTLV-I among the healthy population in the Eastern Province.

Discussion

Because the prevalence rate of HTLV-I antibodies is

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high in the healthy populations in some countries (<2% to >18%), as in parts of Japan, the Caribbean and the Southeastern USA,¹⁻⁴ the introduction of anti-HTLV-I screening tests in Japan and the USA blood bank services was well accepted and understood,^{4,15,16} while other countries have been reluctant to introduce this parameter in their blood screening programs. In July 1995, Saudi Arabia included tests for anti-HTLV-I (and in October 1997 added HTLV-II) to the program of the blood donor services.

Very few studies have been done to record the HTLV-I prevalence in Saudi Arabia. These studies have given prevalence rates of 0.01%, 0.026%, and 0.017%,^{5,17-19} but these figures should be treated with reservation, due to the relatively small sample sizes of 7628,⁵ 26,712,¹⁷ 910,¹⁸ and 12,851.¹⁹ In this study, we used a fairly large sample size of 40,013 from healthy adult donors, from which we obtained a prevalence rate of 0.022%. This prevalence rate is very low, however, the introduction of testing anti-HTLV-I in the blood banks is appropriate, due to the presence of about two million expatriates in the Kingdom. They come from a wide range of countries, including areas that are known to have a high HTLV-I prevalence, and the possibility exists for a donor carrying HTLV-I to contaminate the national blood bank supply.

In Saudi Arabia, donors are normally screened for HBsAg, anti-HCV, anti-HIV-I/II, VDRL (for syphilis) and also for malaria protozoae. All these tests are required to ensure the availability of contamination-free blood, and also maintain the quality of the blood bank service, which is completely free.

Whatever the policy adopted for screening this virus marker or any other, it is to be borne in mind that the life-sustaining benefits of blood transfusion are not achieved without some element of risk. So the decision to transfuse blood must be critically evaluated, and the clinical indications for each transfusion should be unequivocal and clearly justified. At present, there are conflicting views about the need to retain anti-HTLV-I/II screening tests for

the blood donors in non-endemic areas, such as the Middle East countries. A regional or national policy could be of importance in deciding this issue.

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