

Detection of HTLV-II-seropositive Blood Donors in South Vietnam but Not in North Vietnam

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Approximately 1% (4/500) of blood donors exhibited seropositivity for HTLV-II in South Vietnam, but none (0/500) did in North Vietnam. Further, all individuals seropositive for HTLV-II were intravenous drug abusers who were seronegative for HIV-1 and HTLV-I. These findings suggest that HTLV-II infection may be specifically prevalent in drug abusers in South Vietnam.

Key words: HTLV-II — HTLV-II seropositivity — Intravenous drug abuse

Human T-lymphotropic virus type II (HTLV-II) was initially isolated from a patient with hairy cell leukemia in the United States.¹⁾ Recently, it has been demonstrated to be present concomitantly with human immunodeficiency virus (HIV) and human T-lymphotropic virus type I (HTLV-I) in intravenous drug abusers (IVDAs) in the United States.²⁾ Further, HTLV-II infections have been found in the Guaymi Indians in Panama and American Indians in New Mexico.³⁻⁶⁾ All the seropositivity in Orinoco natives of Colombia was recently reported to be due to HTLV-II.⁷⁾ Both this virus and HTLV-I have also been found to be endemic in indigenous populations in Southern Chile.⁸⁾ Although HTLV-II has been suggested to be related to a neurological disorder,⁹⁾ it is not known to be associated with any specific disease, in contrast to HTLV-I.

A seroepidemiologic survey was performed to study the spread of retrovirus infections (HTLVs and HIV) in Vietnam as part of the Vietnam-Japan Collaborative Study of Human Infectious Diseases. One thousand serum specimens of healthy persons or professional blood donors in Vietnam (collected from December 1991 to January 1992) were obtained, of which 500 donors (male: 183, female: 317) were from Viet-Duc Hospital in Hanoi, North Vietnam and another 500 (male: 109, female: 391) were from the Blood Bank in Ho Chi Minh City, South Vietnam. The sera were examined by using gelatin particle-agglutination (PA)⁶⁾ screening tests for HTLV (Serodia-ATLA, Fujirebio Inc., Tokyo)^{10,11)} and for HIV (Serodia-HIV, Fujirebio Inc.).^{11,12)}

In this study, the PA tests for HTLV-I were selected as a primary screening assay for seropositivity for HTLV-I/II because they successfully detect seropositives for HTLV-I or HTLV-II.^{7,8,11)} Various enzyme-linked immunoassays (ELISA)⁵⁾ for HTLV-II are commercially available, but they gave false-positives in more than 50% of the serum specimens of Japanese hemophiliacs who had been injected repeatedly with blood products (M. Honda and R. Lal, unpublished results). Eight serum specimens from HTLV-II-infected individuals in the United States and 20 sera positive for ATL-associated antigens (ATLA) were kindly provided by Dr. Cathleen Lynch, Roche Diagnostic Res., Alameda, CA, USA and Dr. Masayoshi Johno, Kumamoto University Medical School, Kumamoto, respectively and they were used as reference sera.

We tested the sera from 1000 blood donors for antibodies to HTLVs and those sera that reacted above the background level in the PA test for HTLV were then differentiated for seropositivity of HTLV-II by immunoblotting (HTLV Blot 2.3, Diagnostic Biotechnology Pte, Ltd., Singapore Science Park, Singapore) (Fig. 1 and Table I). Lanes 1-4 of sera from South Vietnam were considered seropositive for HTLV-II since the recombinant glycoprotein 46^{11,13)} more than one of the gag proteins of HTLV, and more than one of the env proteins of HTLV were reactive in the blotting. In contrast, no HTLV-II-seropositive donors were detected in North Vietnam. Further, no bands were detected in the 30 sera of normal healthy controls (data not shown). Thus, 0.4% of sera were positive for HTLV-II among blood donors in Vietnam.

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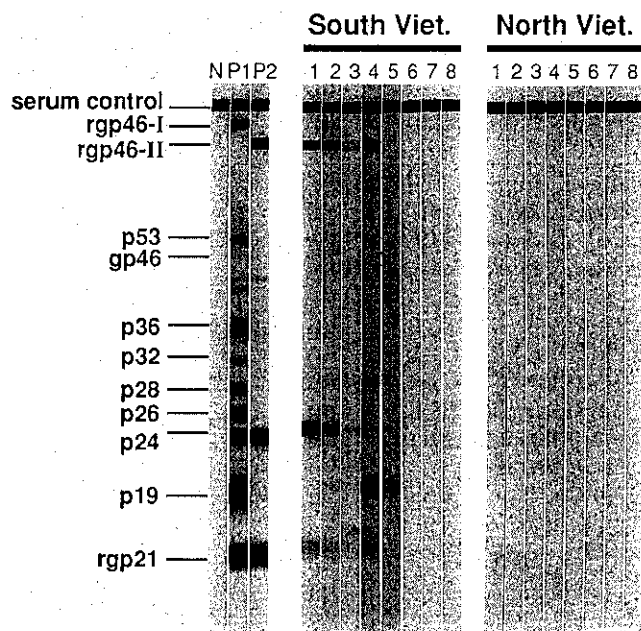


Fig. 1. Confirmation of seropositivity for HTLV-II in blood donors of Vietnam by HTLV-I/II type specific Western blot test. Lane 1 (N); negative control of the assay, lane 2 (P1); positive control for HTLV-I, lane 3 (P2); positive control for HTLV-II. Lanes 1-8 (South Viet.); 4 seropositive donors for HTLV-II (lanes 1-4) and 4 negative donors (lanes 5-8) from South Vietnam. Lanes 1-8 (North Viet.); 8 seronegative donors from North Vietnam.

Table I. Serological Findings of Blood Donors Positive for HTLV-II^{a)}

No.	HTLV PA titer	rgp21	p19	p24	p28	p53	HTLV-I rgp46	HTLV-II rgp46
A. Blood donors in South Vietnam								
1	8192	+w	-	++	-	-	-	+
2	512	+w	-	+	-	-	-	+
3	256	+w	-	+w	-	-	-	+w
4	2048	+w	++	+w	+	+w	-	++
5	16>	-	+w	+w	-	-	-	-
6	16>	-	-	-	-	-	-	-
7	16>	-	-	-	-	-	-	-
8	16>	-	-	-	-	-	-	-
B. Blood donors in North Vietnam								
1	16>	-	-	-	-	-	-	-
2	16>	-	-	-	-	-	-	-
3	16>	-	-	-	-	-	-	-
4	16>	-	-	-	-	-	-	-
5	16>	-	-	-	-	-	-	-
6	16>	-	-	-	-	-	-	-
7	16>	-	-	-	-	-	-	-
8	16>	-	-	-	-	-	-	-
C. Control samples								
Normal	ND	-	-	-	-	-	-	-
HTLV-I	ND	++	++	++	++	++	++	-
HTLV-II	ND	++	-	++	-	-	-	++

a) Five hundred blood donors in South Vietnam and 500 donors in North Vietnam were analyzed for HTLV-II infection by PA test for antibodies to HTLVs followed by an HTLV-I/II type specific Western blot test incorporating HTLV viral lysates and type specific recombinant glycoproteins rgp46 of both viruses. Typical results from 8 blood donors (including all positives) from each group are shown; all other donors were seronegative for HTLV-II. The intensity of the protein band in the Western blot test was graded as follows⁷⁾: -, negative; +w, weakly positive; +, moderately positive; ++, strongly positive. PA titer that was reactive at a serum dilution of more than 16 times was considered positive. Donors 1-4 were judged as seropositive for HTLV-II by reference to Western blot test results with control samples.

Table II. Summary of Blood Donors Seropositive for HTLV-II in Vietnam

No.	Sex/age	Presidential area	HTLV-I seropositivity	HIV seropositivity	HTLV-II seropositivity
1	M/51	Dong Nai	—	—	+
2	M/34	Ho Chi Minh	—	—	+
3	M/61	Ho Chi Minh	—	—	+
4	M/64	Ho Chi Minh	—	—	+

All four individuals were seropositive for HTLV-II by particle-agglutination tests for HTLV followed by immunoblotting. All were clinically asymptomatic. M, male.

Features of HTLV-II-seropositive donors are summarized in Table II. In the seropositive group, all four HTLV-II-positive sera were from male professional blood donors living in Ho Chi Minh City and its neighboring province in South Vietnam and they did not show any immunoblot-reactivity for HTLV-I. The ages of the seropositive donors ranged from 34 to 64 years (mean 52.5 years). Retrospectively, they were identified as IVDAs. Further, no HIV-seropositive donors were detected in the PA-positive sera by immunoblotting for HIV-1 (Immunoblot HIV, Bio-Rad, Richmond, CA, USA).

Collectively, these results show that approximately 1% of these donors in South Vietnam (4/500) were seropositive for HTLV-II, suggesting that HTLV-II may be prevalent in IVDAs in South Vietnam. It is known that HTLV-II was present in American IVDAs by the early 1970s and was introduced into this population before HIV.¹⁴⁾ Could HTLV-II have been introduced into South Vietnam by American IVDAs during the conflict in South Vietnam? Since the war ended about 20 years ago, this might explain the occurrence of the virus in IVDAs in South Vietnam, but not in North Vietnam. Alternatively, since HTLV-II infection has been also reported in geographically isolated Central and South American Indian populations,^{3,5,7)} our HTLV-II seroreactivity may reflect non-i.v.-drug-use-related HTLV-II infection in South Vietnam.

Hall *et al.* previously reported that there may be at least two closely related but distinct genotypes of HTLV-IIa and HTLV-IIb in individuals with or at risk for HIV infection, and in particular IVDAs are at increased risk for the infection in the New York City area.^{15,16)} Further, the New Mexico Indians showed typical subtype a or b viruses on nucleotide sequence analysis,¹⁷⁾ suggesting that the HTLV-II infection of the at-risk population for HIV in the USA might be due to interaction with members of American Indian populations. Similarly, if IVDAs in South Vietnam became infected with the virus from American IVDAs during the conflict, both virus genotypes could be present. Furthermore, HTLV-IIb was recognized in HIV-1-coinfected persons in southeastern Italy¹⁸⁾ and HTLV-IIa in West Africa.¹⁹⁾ Thus, genotyping analysis of HTLV-II might give us information on the geographical source or the route of transmission of HTLV-II in Vietnam.

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