Evidence among Blood Donors for a 30-Year-Old Epidemic of Human T Lymphotropic Virus Type II Infection in the United States

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The demographic and geographic determinants of human T lymphotropic virus types I and II (HTLV-I and -II) are not well defined in the United States. Antibodies to HTLV-I and -II were measured in 1.7 million donors at five US blood centers during 1991–1995. Among those tested, 156 (9.1/105) were HTLV-I seropositive and 384 (22.3/105) were HTLV-II seropositive. In contrast to monotonously increasing age-specific HTLV-I seropositivity, HTLV-II prevalence rose until age 40–49 years and declined thereafter, suggesting a birth cohort effect. HTLV-II infection was independently associated with an age of 40–49 years (odds ratio [OR], 12.4; 95% confidence interval [CI], 8.8–18.9), female sex (OR, 3.3; 95% CI, 2.6–4.1), high school or lower education (OR, 1.7; 95% CI, 1.3–2.1), hepatitis C seropositivity (OR, 25.0; 95% CI, 17.5–35.8), and first-time blood donation (OR, 3.6; 95% CI, 2.8–4.7). HTLV-II seroprevalence was highest at the two West Coast blood centers. These data are consistent with a 30-year-old epidemic of HTLV-II in the United States due to injection drug use and secondary sexual transmission and with an apparent West Coast focus.

Human T lymphotropic virus types I and II (HTLV-I and -II), human retroviruses that were discovered in the early 1980s [1, 2], have disease implications and epidemiologic features that are different from those of the more well-known retrovirus, human immunodeficiency virus (HIV). HTLV-I causes a CD4+ lymphoproliferative malignancy known as adult T cell leukemia in 2%–4% of those infected [3, 4], a chronically progressive myelopathy called tropical spastic paraparesis/HTLV–associated myelopathy (TSP/HAM) in up to 2.4% of seropositive persons [5, 6], and immunologic phenomena, such as uveitis [7] and arthritis [8]. HTLV-II has also been implicated recently in TSP/HAM [6] and may cause a moderately increased susceptibility to bacterial infections [9].

HTLV-I is endemic in central Africa [10], in countries with a history of slavery in the Caribbean basin and South America [11–13], and, for unknown reasons, in southern Japan [14].

HTLV-II has recently been found to be endemic in Indian tribes in North, Central, and South America [15] and is epidemic among injection drug users and their sex partners in the United States and Europe [16, 17]. Perhaps because seroprevalence rates for both HTLV-I and -II are <0.05% among US blood donors [18], the demographic and geographic determinants of these infections are less well defined in the United States than in countries with a higher prevalence.

An investigation of the epidemiology of HTLV-I and -II in the United States could define additional risk factors for infection, which might, in turn, be important in proposing new selection criteria for blood donors. Such data would also be useful in modeling the population dynamics of two human retroviral infections that appear to have preceded the current HIV epidemic. We therefore studied the demographic and geographic correlates of HTLV-I and -II seroprevalence among 1.7 million US blood donors participating in the multicenter Retrovirus Epidemiology Donor Study (REDS).

Methods

Study design and population. The study design was a cross-sectional analysis of HTLV-I and -II antibody test results and computerized data on the demographic and blood donation characteristics of blood donors at the five REDS blood centers, which are located in Baltimore/Washington, DC, Detroit, Oklahoma City, San Francisco, and Los Angeles. The study population for this analysis consisted of all volunteer blood donors at the five blood centers during the 1991–1995 period.

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The study protocol was approved by the relevant institutional review boards at the REDS blood centers.

* Study group members are listed after the text.

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donors who passed routine predonation screening designed to exclude those with risk factors for transfusion-transmitted infections [19] and who completed ≥1 nonautologous blood donations during the calendar years 1991–1995. Specifically, among other exclusion criteria, all subjects denied ever injecting drugs, ever having had male-to-male sex, and having had sex with an injection drug user within the past year. One innovation of the REDS has been to introduce the routine collection of supplemental demographic data from all blood donors at the five participating centers, as described in detail elsewhere [20].

Laboratory testing. Serologic testing for HTLV-I and -II was done according to standard operating procedures at the five REDS blood centers. Any specimen testing reactive on the initial screening EIA was retested in duplicate, and those with ≥2 of 3 reactive results were further tested on supplemental serologic tests with positive criteria as recommended by the manufacturer. A blood donation was deemed HTLV-I or -II seropositive if repeatedly reactive EIA and positive supplemental results were both obtained. Finally, differentiation of the seropositive samples into HTLV-I, HTLV-II, and type-indeterminate categories was done using type-specific recombinant peptide assays in either an EIA or immunoblot format [21, 22]. Confirmed HTLV-I or -II seropositive samples with typing data that were missing, negative, discordant, untypeable, or both HTLV-I and -II positive were considered undifferentiated and were eliminated from this analysis. The type and manufacturer of screening EIA, supplemental immunoblots, and HTLV type-specific tests varied by blood center and by time during the study period (detailed information is available from the corresponding author upon request). Testing for antibody to hepatitis C virus (HCV) was done using HCV EIA 1.0 from 1991 through March/April 1992 and HCV EIA 2.0 thereafter (both from Ortho Diagnostics, Raritan, NJ, or Abbott, North Chicago). Supplemental HCV testing using a recombinant immunoblot (RIBA 2.0; Chiron, Emeryville, CA, or Matrix [unlicensed]; Abbott) was available for two centers during the entire study period and for the other three centers after June 1991.

Data analysis. REDS donation-specific data from the calendar years 1991–1995 formed the basis of the analysis. Because 1 individual could be represented >1 time in the data set due to repetitive blood donation within this time period, multiple donations from the same person were combined into a single donor-specific record. Because 1 set of characteristics was assigned to each donor, information collected from all donations provided by the donor during 1991–1995 was considered (previously described in [20]). Specifically, a blood donor was considered seropositive for a viral marker if any of his or her blood donations were seropositive by the above definition. Age was assigned as of the last date of donation. Donors were classified according to the profile of their donation types, and donors who gave only autologous or miscellaneous (i.e., therapeutic phlebotomy or research) donations were eliminated from study. Autologous-only donors were excluded because they represented <4% of the donor data set, and preliminary analyses demonstrated that they have different demographics and higher rates of most infectious disease markers than community, directed (for a specific individual), or apheresis donors.

Crude and stratified HTLV-I and -II seroprevalence rates, with 95% confidence intervals (95% CIs) by the SAS BETAINV function (SAS, Cary, NC), were calculated. Multiple logistic regression was performed with the SAS LOGISTIC procedure. All variables with significant univariate associations with either HTLV type were entered into the model, but only those variables that were significantly (P < .05) associated with HTLV-I or -II were retained in the final model.

Results

Study population. The demographic and blood donation characteristics of the study population are shown in table 1. Of the 1,718,213 blood donors analyzed, the largest number of donors were <30 years of age, and there were slightly more men than women. Most donors were white (78%), followed by black (8%), Hispanic (7%), and Asian or other (5%) donors. The educational level was quite high, with 34% having a college degree or higher education. Eight percent reported a birthplace other than the United States. Ninety-two percent gave only community (allogeneic) blood donations, with the rest comprising directed, apheresis, or mixed types of blood donation. Thirty-five percent gave their first and only blood donation during the 5-year period of the study, 22% gave their first and ≥1 additional donation, and 44% were repetitive blood donors. Thirty-five percent donated at the two West Coast blood centers, 13% at the Oklahoma City, 24% at the Detroit, and 28% at the Baltimore/Washington blood centers. Only 5% had themselves received a blood transfusion, and 0.4% were HCV seropositive.

There were 615 (36/105) subjects who were confirmed seropositive for HTLV-I or -II, including 156 (9/105) typed as HTLV-I seropositive and 384 (22/105) typed as HTLV-II positive. Seventy-five subjects with confirmed HTLV-I or -II antibody who could not be differentiated into either HTLV-I or -II were excluded from further analysis.

HTLV-I seroprevalence. HTLV-I seroprevalence increased steadily with age in both sexes, reaching a maximum of 24/105 in women and 16/105 in men (figure 1A). HTLV-I seroprevalence was higher among women (12/105) than men (6/105) and was highest among black donors, intermediate among Hispanic and Asian/other donors, and lowest among white donors (table 1). There was no significant difference among the education strata, but those born outside of the United States had almost three times the seroprevalence of US-born donors. Those donating blood for the first/only time (those whose index donation was their only donation during the study period) had an HTLV-I seroprevalence twice as high as repeat blood donors, while first-
Table 1. Seroprevalence of human T lymphotropic virus types I (HTLV-I) and II (HTLV-II), by demographic and risk factor categories, among 1,718,213 blood donors from five US cities, 1991–1995.

<table>
<thead>
<tr>
<th>Variable</th>
<th>HTLV-I prevalence</th>
<th>HTLV-II prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of donorsa</td>
<td>×10^4 donors (95% CI)</td>
</tr>
<tr>
<td>Sex and age (years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men &lt;30</td>
<td>903,360</td>
<td>6 (5–8)</td>
</tr>
<tr>
<td>Men 30–39</td>
<td>344,992</td>
<td>2 (1–4)</td>
</tr>
<tr>
<td>Men 40–49</td>
<td>182,894</td>
<td>11 (7–18)</td>
</tr>
<tr>
<td>Men ≥60</td>
<td>49,070</td>
<td>16 (7–32)</td>
</tr>
<tr>
<td>Women &lt;30</td>
<td>814,701</td>
<td>12 (10–15)</td>
</tr>
<tr>
<td>Women 30–39</td>
<td>336,051</td>
<td>3 (1–5)</td>
</tr>
<tr>
<td>Women 40–49</td>
<td>210,269</td>
<td>14 (9–20)</td>
</tr>
<tr>
<td>Women 50–59</td>
<td>160,656</td>
<td>22 (15–30)</td>
</tr>
<tr>
<td>Women ≥60</td>
<td>74,269</td>
<td>22 (12–35)</td>
</tr>
<tr>
<td>Race/ethnicity</td>
<td></td>
<td></td>
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<tr>
<td>White</td>
<td>1,339,867</td>
<td>4 (3–6)</td>
</tr>
<tr>
<td>Black</td>
<td>132,998</td>
<td>44 (34–57)</td>
</tr>
<tr>
<td>Hispanic</td>
<td>117,726</td>
<td>13 (7–21)</td>
</tr>
<tr>
<td>Asian/other</td>
<td>87,408</td>
<td>14 (7–24)</td>
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<tr>
<td>Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than high school</td>
<td>223,800</td>
<td>5 (2–8)</td>
</tr>
<tr>
<td>High school graduate</td>
<td>287,188</td>
<td>12 (8–17)</td>
</tr>
<tr>
<td>Some college</td>
<td>570,931</td>
<td>10 (8–13)</td>
</tr>
<tr>
<td>College graduate</td>
<td>382,214</td>
<td>7 (5–10)</td>
</tr>
<tr>
<td>Master’s/professional degree</td>
<td>209,702</td>
<td>6 (3–11)</td>
</tr>
<tr>
<td>Birthplace</td>
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<td></td>
</tr>
<tr>
<td>United States</td>
<td>1,556,981</td>
<td>7 (6–9)</td>
</tr>
<tr>
<td>Outside United</td>
<td>138,359</td>
<td>21 (14–30)</td>
</tr>
<tr>
<td>Donation type</td>
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<tr>
<td>Community only</td>
<td>1,572,488</td>
<td>9 (7–10)</td>
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<tr>
<td>Directed/other/mixed</td>
<td>145,725</td>
<td>13 (8–20)</td>
</tr>
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<td>Donation history</td>
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<tr>
<td>First-time/only-time</td>
<td>592,980</td>
<td>16 (13–19)</td>
</tr>
<tr>
<td>First-time/repeat donor</td>
<td>373,513</td>
<td>1 (0–3)</td>
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<tr>
<td>Repeat donor</td>
<td>751,694</td>
<td>8 (6–10)</td>
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<tr>
<td>Blood center</td>
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<tr>
<td>Baltimore/Washington, DC</td>
<td>485,246</td>
<td>10 (7–13)</td>
</tr>
<tr>
<td>Detroit</td>
<td>404,077</td>
<td>6 (4–9)</td>
</tr>
<tr>
<td>Oklahoma City</td>
<td>223,731</td>
<td>7 (4–12)</td>
</tr>
<tr>
<td>San Francisco</td>
<td>149,993</td>
<td>8 (4–14)</td>
</tr>
<tr>
<td>Los Angeles</td>
<td>455,166</td>
<td>12 (9–15)</td>
</tr>
<tr>
<td>Ever transfused</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>93,337</td>
<td>20 (12–32)</td>
</tr>
<tr>
<td>No</td>
<td>1,610,953</td>
<td>8 (7–10)</td>
</tr>
<tr>
<td>Hepatitis C antibody</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>7,318</td>
<td>109 (47–215)</td>
</tr>
<tr>
<td>No</td>
<td>1,710,895</td>
<td>9 (7–10)</td>
</tr>
</tbody>
</table>

NOTE. CI, confidence interval.

* Because of missing data, numbers may not total 1,718,213.

Figure 1. Age- and sex-specific seroprevalence of human T lymphotropic virus types I (HTLV-I) (A) and II (HTLV-II) (B) among blood donors in 5 US cities participating in multicenter Retrovirus Epidemiology Donor Study. Age-specific seroprevalences for women (●) and men (○) are expressed per 100,000 donors.
Table 2. Odds ratios (ORs) and 95% confidence intervals (CIs) from final logistic regression modeling of risk factors for human T lymphotropic virus types I (HTLV-I) and II (HTLV-II) seropositivity among blood donors from five US cities, 1991–1995.

<table>
<thead>
<tr>
<th>Variable</th>
<th>HTLV-I model</th>
<th>HTLV-II model</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age (years)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;30</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>30–39</td>
<td>6.0 (3.3–11.1)</td>
<td>7.5 (5.1–11.0)</td>
</tr>
<tr>
<td>40–49</td>
<td>10.7 (5.8–19.6)</td>
<td>12.4 (8.8–18.9)</td>
</tr>
<tr>
<td>50–59</td>
<td>13.0 (6.7–25.4)</td>
<td>6.3 (3.9–10.8)</td>
</tr>
<tr>
<td>≥60</td>
<td>19.1 (8.9–40.7)</td>
<td>6.9 (3.8–13.6)</td>
</tr>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Female</td>
<td>2.0 (1.4–2.8)</td>
<td>3.3 (2.6–4.1)</td>
</tr>
<tr>
<td><strong>Race/ethnicity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>1.0 (…)</td>
<td>1.0 (…)</td>
</tr>
<tr>
<td>Black</td>
<td>10.4 (7.2–15.1)</td>
<td>12.3 (8.6–18.0)</td>
</tr>
<tr>
<td>Hispanic</td>
<td>2.6 (1.4–4.5)</td>
<td>1.2 (0.2–9.3)</td>
</tr>
<tr>
<td>Asian/other</td>
<td>2.3 (1.1–4.5)</td>
<td>10.9 (5.9–21.6)</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
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</tr>
<tr>
<td>Some college or more</td>
<td>1.0 (…)</td>
<td>1.0 (…)</td>
</tr>
<tr>
<td>High school or less</td>
<td>1.7 (1.3–2.1)</td>
<td></td>
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<tr>
<td><strong>Birthplace</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>United States</td>
<td>1.0 (…)</td>
<td>1.0 (…)</td>
</tr>
<tr>
<td>Outside United States</td>
<td>2.5 (1.5–4.0)</td>
<td>0.5 (0.3–0.8)</td>
</tr>
<tr>
<td><strong>Donation history</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Repeat donor</td>
<td>1.0 (…)</td>
<td>1.0 (…)</td>
</tr>
<tr>
<td>First-time/only-time</td>
<td>2.8 (2.0–4.0)</td>
<td>3.6 (2.8–4.7)</td>
</tr>
<tr>
<td>First-time/repeat donor</td>
<td>0.2 (0.1–0.6)</td>
<td>0.7 (0.4–1.1)</td>
</tr>
<tr>
<td><strong>HCV serology</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td>1.0 (…)</td>
<td>1.0 (…)</td>
</tr>
<tr>
<td>Positive</td>
<td>5.3 (2.6–11.1)</td>
<td>25.0 (18.7–32.4)</td>
</tr>
</tbody>
</table>

NOTE. HCV, hepatitis C virus.

* Dual data for HTLV-II model are east centers (upper line), west centers (lower line).

HTLV-I, there was an inverse association between HTLV-II seroprevalence and educational attainment and no difference in prevalence between those born in or outside the United States. One-time/only-time blood donors, those with a history of receiving a blood transfusion, and those seropositive for HCV all had a higher seroprevalence of HTLV-II.

Finally, there was significantly (P < .001) higher HTLV-II seroprevalence at the San Francisco and Los Angeles blood centers (38/10⁵ and 40/10⁵) than at the Oklahoma City, Detroit, and Baltimore/Washington centers (16/10⁵, 8/10⁵, and 15/10⁵, respectively). In light of this geographic difference, we reexamined the HTLV-II age- and sex-specific seroprevalence, comparing the two West Coast centers with the other three blood centers for both women (figure 2 A) and men (figure 2 B). The birth cohort effect already seen for overall HTLV-II seroprevalence in figure 1B was limited to the West Coast blood centers in both male and female donors.

In the logistic regression analysis for HTLV-II, blood center location coded as West (San Francisco and Los Angeles) versus East (all other centers) appeared to interact with both age and race/ethnicity. We chose to present the latter relationship in table 2, because the former is well illustrated in figure 2, and ORs for other variables did not differ between the two models. The strongest associations were observed for HCV seropositivity (OR, 25.0; 95% CI, 18.7–32.4), the West Coast/black variable (OR, 24.4; 95% CI, 16.4–38.3), and age 40–49 years (OR, 12.4; 95% CI, 8.8–18.9). The blood center/race-ethnicity interaction was most evident in comparing the ORs of the western Hispanics (OR, 14.8) with eastern Hispanics (OR, 1.2); the latter was not significantly different from the eastern white reference group.

Discussion

This analysis has revealed significant nonhomogeneity of HTLV-I and especially HTLV-II seroprevalence among US blood donors. The most interesting result is the observation of an apparent birth cohort effect for HTLV-II, with a West Coast predominance of this phenomenon. HTLV-II seroprevalence...
was also highest in female donors, those with a high school or lower education, blacks and Hispanics, and those seropositive for HCV. The results for HTLV-I are consistent with those for studies from HTLV-I-endemic areas, showing that seroprevalence was associated with older age, female sex, and black race/ethnicity.

Potential explanations for the age- and sex-specific HTLV-II seroprevalence curve in figure 1B include (1) waning HTLV-II antibody in older infected persons; (2) the selective deferral from blood donation of older HTLV-II-seropositive persons or those at increased risk of HTLV-II infection; (3) a birth cohort effect produced by an increased prevalence of HTLV-II among donors born between 1942 and 1965, who would be 30–49 years old in 1991–1995 (a birth cohort effect is said to be present when disease or infection prevalence varies by year of birth regardless of age) [23]; or (4) a combination of the above. There is no evidence that HTLV-I or -II antibody titer decreases with age; in fact, the converse may be true [24]. Although older donors could have been more likely to self-defer because of HTLV-II risk factors, such as injection drug use (IDU) or sex with an injection drug user, they also have a lower prevalence of IDU [25].

Given extensive evidence in the literature that US HTLV-II infection is associated with IDU or sex with an injection drug user [26, 27], we believe that the birth cohort effect in this study is due to an epidemic of IDU-related HTLV-II in the late 1960s and 1970s, with secondary transmission by sexual contact. This is supported by several lines of evidence. First, a study of injection drug users from the early 1970s showed high HTLV-II prevalence [28]; to our knowledge, no data are available from injection drug users in the 1960s or earlier. A 1989–1990 study of San Francisco General Hospital outpatients also has reported maximum HTLV-II age prevalence in the 40–49-year-old age group [29]. Second, the 1993 REDS survey, mailed to donors within 1–2 months after they successfully donated blood, found that the prevalence of lifetime IDU or sex with an injection drug user reached maxima of 1.1% and 4.5%, respectively, among 35- to 44-year-old donors and declined in older age groups [30]. Unpublished data from the US National Household Survey on Drug Abuse also suggest that the lifetime prevalence of IDU was highest in the same birth cohort [25], probably due to the epidemic of IDU during the late 1960s and the 1970s. Finally, there is a similar age-specific seroprevalence pattern of HCV among US blood donors, albeit with an age maximum of 30–39 years and higher prevalence in men than women [20]. HCV is highly associated with IDU, although its relative lack of transmission by sexual contact explains its high prevalence in male injection drug users but not their female partners.

The age and sex associations of HTLV-II seroprevalence found in this blood donor study may be compared with those reported in other populations. HTLV-II seroprevalence is higher in women and increases steadily with age among Panamanian Guaymi [31] and Argentinian Gran Chaco [32] Indians. The Indian pattern, reminiscent of that for HTLV-I endemic populations, has been attributed to ongoing sexual transmission, which is more efficient from men to women than from women to men. Among injection drug users in the United States, HTLV-II seroprevalence increases even more steeply with age until at least the age of 40–50 years [16, 33, 34]. However, it is difficult to be certain that prevalence continues to increase in older injection drug users, because these studies have combined injection drug users older than 40, 45 or 50 years, respectively, into a single age group. The steadily increasing age-specific HTLV-II seroprevalence among injection drug users has been explained by the cumulative exposure to IDU-related infections [33], which have been estimated to occur at an incidence of 0.7/100 person years in Baltimore [35]. In contrast, the high female HTLV-II seroprevalence and its maximum in the 30- to 49-year-old age group in our blood donor curves in figure 1 may be due in part to the fact that women who have had sex with injection drug users are more likely to donate blood than are injection drug users themselves [36].

The high HTLV-II seroprevalence at the two western blood centers, combined with the restriction of the birth cohort phenomenon to these same centers, suggests that whatever produced the birth cohort effect was concentrated on the West Coast. Two large studies of HTLV-II seroprevalence among injection drug users, with data from eight and seven cities, respectively, both found the highest HTLV-II seroprevalence in Los Angeles [16, 34]. The interaction that we observed between West Coast blood center and Hispanic race/ethnicity may possibly be due to an endemic focus of HTLV-II infection among West Coast Hispanics with Indian ancestry. Another possibility is that a low prevalence of HTLV-II within all injection drug users was selectively amplified on the West Coast by the IDU epidemic of the 1960s and 1970s.

The epidemiologic correlates of HTLV-I infection observed in this study are similar to those reported by other US studies [27, 36]. The steady increase in prevalence with age is evidence against an epidemic of HTLV-I, and the association with black race/ethnicity is consistent with the presence of this virus among Africans for at least several hundred years. That those born outside the United States had higher HTLV-I seroprevalence is also consistent with HTLV-I endemic areas of Africa, the Caribbean, and Japan. The HCV association for HTLV-I, albeit much weaker than for HTLV-II, may indicate that HTLV-I is also transmitted by IDU in the United States.

Potential shortcomings of the current study must be considered in weighing its data and conclusions. First, blood donors, because of self-selection and -deferral of potential donors with risk factors for infections or other health conditions, are not representative of the general population. In general, the prevalence of infectious diseases is several-fold higher in the general population. Second, differential deferral of subgroups could account for some of the demographic associations we observed.
For example, the 3-fold higher odds of HTLV-II in women may be exaggerated by the more efficient deferral of injection drug users (predominantly men) compared with their casual or remote sex partners (mostly women). Finally, HTLV-I and -II seroprevalence may have been overestimated due to false-positive supplemental testing at some blood centers. However, HTLV-II seroprevalence may also have been underestimated, because licensed HTLV-I-based screening assays have lower sensitivity for anti-HTLV-II, and samples classified as untestable by the HTLV type-specific assays (and excluded from this analysis) may in fact have been HTLV-II seropositive [37, 38].

In conclusion, the birth cohort effect for HTLV-II is consistent with a 30-year-old epidemic of this virus among US blood donors and is in contrast to an epidemiologic pattern for HTLV-I that is more similar to that in areas endemic for HTLV-I. We hypothesize that this HTLV-II epidemic was driven by the epidemic increase in IDU in the 1960s and 1970s. The interaction between Hispanic race/ethnicity and West Coast blood donation suggests the need for additional investigation on the possible source of the HTLV-II epidemic. The concept of injection drug users as a vector for both HTLV-II and HCV in blood donors highlights the need for better public health strategies to control IDU and to develop better screening strategies to exclude from blood donation potential donors with a past history of IDU. The birth cohort effect seen in this study for HTLV-II suggests that improved screening strategies might be most usefully applied to 40- to 49-year-old donors in the western United States.

Retrovirus Epidemiology Donor Study (REDS) Group Members


References


