

## Rapid Communication

# Spread of Human Retrovirus Infections in Individuals at the Second and Third Decades of Life in São Paulo, Brazil

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The authors comment the spread of the human immunodeficiency virus 1 (HIV-1) and the human T-cell lymphotropic virus types 1 and 2 (HTLV-1 and HTLV-2, here named HTLV) in the last years (from 2010 to 2016) in individuals at the second and third decades of life in Brazil and in São Paulo city. Data on the age and gender of 1,715 HIV-1-infected individuals whose blood samples were sent to Instituto Adolfo Lutz for HTLV-1/2 infections determination were analyzed, and they were compared with the facts described in the Brazilian scientific literature. These retroviruses in adolescents and young adults is on the increase, and the unprotected sexual contact has been presently pointed as the probable risk factor associated with these retroviruses spread in this parcel of population. These data are of concern, and the surveillance study on these viruses is justified for properly controlling the retroviruses spread in the country.

**Keywords:** Human retroviruses; HIV-1; HTLV; Risk factors; Surveillance**Abbreviations**

AIDS: Acquired Immune Deficiency Syndrome; ELISA: Enzyme Linked Immunosorbent Assay; HIV-1: Human Immunodeficiency Virus Type 1; IAL: Instituto Adolfo Lutz; HTLV: Human T-Cell Lymphotropic Virus; HTLV-1: Human T-Cell Lymphotropic Virus Type 1; HTLV-2: Human T-Cell Lymphotropic Virus Type 2; IVDU: Intravenous Drug Use; OR: Odds Ratio

**Introduction**

From 1980 to June 2016, the Ministry of Health of Brazil notified 842,710 human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS) cases in the country; and 136,945 new cases were notified after 2007 (being 71,396 in the Southeast region) [1]. An increase in the number of individuals aged from 15 to 34 years old was observed, with a male to female ratio of 2.4:1.0, and the sexual exposure being as the major risk factor [1]. At present, 50.4% of males referred homosexual practice, 36.8% heterosexual, and 9.0% bisexual; conversely, 96.4% of females mentioned heterosexual contact [1]. Human T-cell lymphotropic virus types 1 and 2 (HTLV-1 and HTLV-2, here named HTLV) are endemic in Brazil, and nearly 2 million individuals are HTLV-infected [2,3].

HIV and HTLV share some routes of virus infection and the dual or triple co-infection can occur. The Instituto Adolfo Lutz (IAL), a Public Health Laboratory in São Paulo city-São Paulo State (Southeast Brazil), carries out the surveillance studies on human retroviruses, and the trend in occurring HTLV infections in HIV-1-infected individuals [4-8].

**Materials and Methods**

The present study analyzed the characteristics and the data from 1,715 HIV-1-infected individuals (523 females and 1,192 males) attended at three AIDS care services in São Paulo city from 2010 to 2016, whose blood samples were tested for HTLV infection at IAL.

The study population was divided into five age-groups (G1: 16 to 25 years, G2: 26 to 30 years, G3: 31 to 40 years, G4: 41 to 50 years, and G5: >50 years old), and according to the gender.

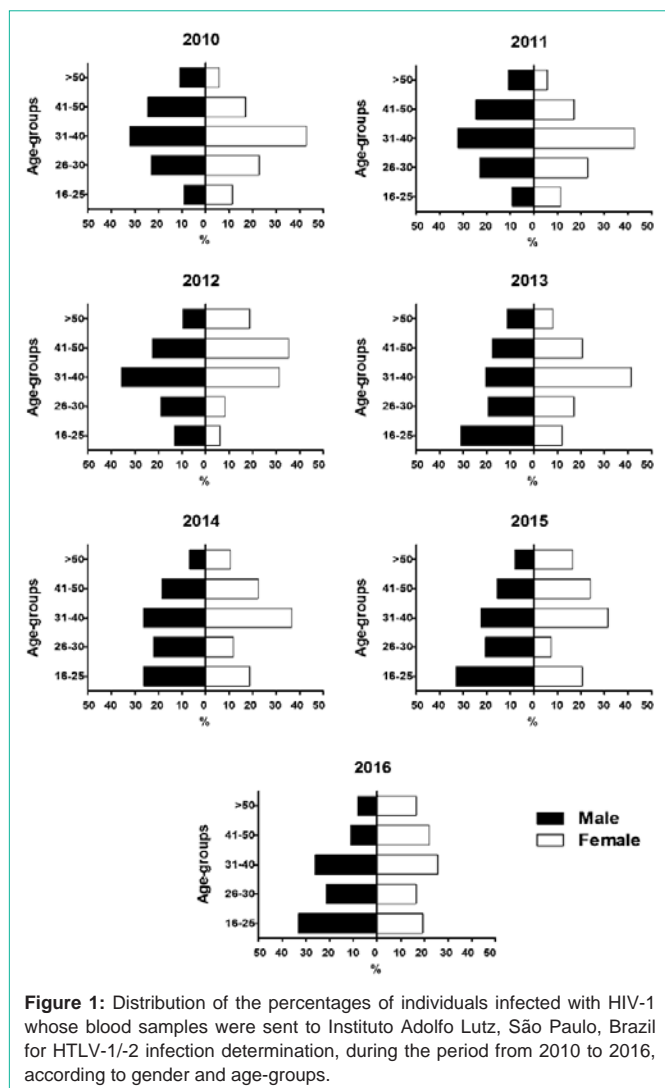
The collected blood samples were separated into plasmas and peripheral blood leukocytes. The plasma samples were screened for the presence of HTLV-1/2-specific antibodies using the enzyme immunoassay Gold ELISA HTLV-I+II, REM, São Paulo, SP, Brazil, and confirmed by Western blotting (HTLV Blot 2.4, MP Biomedicals, and Solon, OH, USA). The assays and criteria of positivity were performed according to the manufacturer instructions.

**Results and Discussion**

During the study period an increase in the percentages of HIV-infected males in G1 was detected (<10.0% in 2010 vs. 33.0% in 2016), as well as in patients of G2 (<10.0% in 2010 vs. 22.0% in 2016) (Figure 1). Among females, although in minor percentages of cases, an increase in HIV infection in G1 was found (Figure 1), confirming the data from the Brazilian Ministry of Health [1].

Concerning the HIV/HTLV co-infection, 62 (3.6%) patients were HTLV positive (1.6% females and 2.0% males). Curiously, during the years from 2010 to 2014, 33 HTLV positive cases (15 females and 18 males) were detected in patients aged >30 years old (G3, G4, and G5). However, from 2015 to 2016, among 29 HTLV positive cases (13 females and 16 males) three patients were <30 years old (one in G1 and two in G2). Although it is likely that more men were HTLV positive, an association with female gender was detected (OR=1.93, 1.12-3.30), corroborating the previous data from IAL studies [7,8]. Noteworthy, an increase of HTLV infection among males was detected in 2016.

The intravenous drug use (IDU) was the most important risk factor for HTLV infection in HIV-1-infected individuals at the beginning of AIDS epidemic [4,5,7], whereas at present time it has not been common in São Paulo. The hypothesis for this occurrence is that HTLV have been spreading among the HIV-infected individuals



**Figure 1:** Distribution of the percentages of individuals infected with HIV-1 whose blood samples were sent to Instituto Adolfo Lutz, São Paulo, Brazil for HTLV-1/2 infection determination, during the period from 2010 to 2016, according to gender and age-groups.

by sexual contact. In fact, for supporting this hypothesis, although HTLV were efficiently transmitted by means of parenteral route, this course did not account for the new HTLV infections in Brazil. The serology of HTLV became mandatory in blood banks in 1993 [9]; and the programs providing the IDUs with sterile needles and syringes and the changes in the drug usage patterns from injecting cocaine to smoking crack cocaine were implemented in the decades of 1980 and 1990 [7]. Thus, the sexual transmission seems to occur and this accounts for the new HTLV-infected individuals in Brazil. Corroborating this hypothesis, HTLV sexual transmission was pointed as the primary transmission route from men to women [10].

## Conclusion

Considering as a matter of concern, the increase in the number of HIV-1 and the HTLV infections in the last years in adolescents

and young adults in Brazil, these parcels (age-groups) of individuals deserve the attention from the public health authorities. In these individuals, the infections with human retrovirus could be associated with the unprotected sexual contact and promiscuity after consuming drugs as alcohol, marijuana, crack, amphetamines, and hallucinogens. Thus, the surveillance of HIV and HTLV is important for properly controlling the retroviruses spread in Brazil, and an agenda for conducting research and action seems to be adequate at this time.

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