



Human T-Cell Lymphotropic Virus (HTLV-1) Infection in the Democratic Republic of the Congo: A Review of a Forgotten Epidemic

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Abstract

Background: The distribution of HTLV affects nearly 7 million people around the world. The prevalence of this infection varies among different geographic regions as well as populations. **Objective:** The objective of this review was to present the epidemiological data on HTLV infection in the Democratic Republic of the Congo. **Method:** This review consisted of cataloging various studies, published articles and summaries presented in scientific conferences having as a subject of interest the epidemiology of HTLV in the Democratic Republic of the Congo (DRC). The search was done using MEDLINE/PubMed, Embase (Via Ovid), Cochrane, Google scholar, and POPLINE. To identify the articles from the different sources, the search was carried out using the following keywords: “HTLV, HTLV Infection, HTLV Epidemiology, Kinshasa, Democratic Republic of the Congo”. Publications were selected according to the relevance of the methodology as well as the results and the representativeness of the samples. **Results:** In 1990, Kayembe K. *et al.* conducted a study in the city of Lisala on 32 patients screened for chronic symmetrical spastic paraparesis of which 25 (96%) had anti-HTLV-1 markers in their serum. Goubau P. *et al.* had 102 sera samples collected in 1970 from a population of Bambuti pygmies in Zaire, 14 (13.7%) were positive for HTLV-2. Jeannel D. *et al.* conducted a study in Inongo in 1990 on 1162 patients, 36 (3.1%) were positive for anti-HTLV-1 markers. In the same year, Moulia-Pelat J.P. *et al.* conducted 2 studies, one on 230 Pygmies and the other on 680 Bantu, the prevalence of HTLV markers was 8.3% and 5.5% in Pygmies and Bantu respectively. In another study carried out by Goubau P. *et al.* in 1993, the preva-

lence of HTLV varied between 1% among pregnant women in Kinshasa and 15% among blood donors in Basankusu in Zaire. In 1995, Eric Delaporte *et al.* worked on 2349 different samples, 43 cases (3.7%) of pregnant women and 86 cases (7.3%) of prostitutes were diagnosed positive for HTLV. Between 1994 and 1998, 41 samples from women with spastic paralysis of the lower limbs were collected by Tshala KD *et al.*, no sample was positive for HTLV. **Conclusion:** This analysis shows that HTLV infection was of interest in the nineties and has lost interest today. Its prevalence in this decade was between 1% and 15% in the Democratic Republic of the Congo. It was higher than that of HIV during the same period.

Subject Areas

Epidemiology

Keywords

HTLV, Infection, Epidemiology, Democratic Republic of the Congo

1. Introduction

Human Lymphotropic T-cell virus type 1 and 2 (HTLV-1 and HTLV-2) belong to the family Retroviridae and the genus deltaretrovirus [1] [2]. HTLV-1 and HTLV-2 were the first pathogenic human retroviruses to be identified in humans in the 1980s [1] [2].

For a long time, the scientific world considered HTLV to be the probable cause of Acquired Immunodeficiency Syndrome (AIDS) [3].

The distribution of HTLV-1 affects nearly 7 million (5 - 10 million) people worldwide [4]. HTLV-1 is one of the most potent oncogenic human viruses [5].

Etiologically, HTLV-1 has been associated with adult T cell leukemia/lymphoma, which is a very aggressive and fatal malignant tumor. HTLV-1 is also associated with other inflammatory disorders, including infectious dermatitis and uveitis [6]. In addition, a recent study showed that HTLV-1 was associated with atherosclerosis in the elderly in an area of high seroprevalence [7].

HTLV-1/2 has a typical latency period of 20 to 30 years after infection. Hence, infected people can remain asymptomatic carriers for many years, while transmitting the virus [8].

The prevalence of this infection varies among different geographic regions as well as populations. HTLV-1 has extensive but uneven worldwide distribution. Highly endemic areas include sub-Saharan Africa, the Caribbean, parts of South America and southern Japan. HTLV-2 infection has an even more restricted distribution than that of HTLV, mainly among African Pygmies and Native Americans of North, Central and South America [8] [9] [10] [11]. It was believed that, from the early years, HTLV-2 was spread by Injection Drug Users (IDU), so in the United States and southern Europe, the prevalence rates were higher, ranging

from 10% to 15% or more, have been described [12] [13] [14].

The routes of transmission of the human T-Lymphotropic virus include vertical transmission from infected mothers to newborns and through breastfeeding, unprotected sexual practice, parenteral transmission by transfusion, organ transplantation and needle distribution, contaminated syringes in intravenous drug addicts [13] [15] [16]. Evidence has shown that transfusion of HTLV infected blood is perhaps the most efficient mode of transmission of the virus due to the presence of lymphocytes infected, with a seroconversion rate of 27% to 63% after exposure to seropositive cellular blood components, but testing all blood donations in some high-income countries, transfusion-transmitted HTLV has been largely controlled [17].

Sub-Saharan Africa (SSA) is one of the most endemic regions for HTLV-1/2 [18]. Despite recommendations that blood intended for transfusion should be screened for transfusion-transmissible infections, screening for antibodies derived from blood from donated blood products has only been implemented in some countries, possibly due to limited resources.

Hence the objective of this analysis was to present the epidemiological data on HTLV infection in the Democratic Republic of the Congo.

2. Methods

2.1. Literature Search

This study consisted in cataloging the various works, published articles and summaries presented in scientific conferences having as subject of interest the HTLV in Kinshasa and the Democratic Republic of the Congo (DRC). The publication was searched using MEDLINE/PubMed, Embase (Via Ovid), Cochrane, Google scholar, and POPLINE. To identify the articles from the different sources, the search was carried out using the keywords “HTLV, HTLV infection, HTLV epidemiology, Human Lymphotropic virus, Democratic Republic of the Congo”. The publications were selected according to the relevance of the methodology as well as the results and the representativeness of the samples.

2.2. Study Selection

Studies were included if: 1) they estimated the prevalence of HTLV-1/2; and 2) were performed in DRC. Case studies, reviews, editorials and commentaries were excluded. Studies presented as abstracts or conference proceedings whose results did not contain sufficient information to properly assess the quality of the studies were excluded. **Table 1** presents the grading of the studies included in the revue.

3. Results and Discussion

The objective of this analysis was to present the various works carried out and published on the Human T-Cell Lymphotropic Virus in the Democratic Republic of the Congo (DRC). Seven studies were documented for the DRC, responding in particular to the various selection criteria. **Table 2** presents all the studies

and data included in the revue. According to these various studies published and presented at conferences, the populations most targeted for studies on HTLV were Professional Sex Workers (PSW), pregnant women and pygmies.

In 1990, Kayembe K. *et al.* conducted a study in the city of Lisala in Equateur province in Zaire, currently the Democratic Republic of the Congo. Thirty-two (32) patients screened for chronic symmetrical spastic paraparesis were included for the search for HTLV-1 markers. Twenty-nine (29) presented with slowly progressing disease and 25 (96%), including 9 males and 16 females, had anti-HTLV-1 in their serum [19].

Goubau P. *et al.* had, out of 102 sera samples collected in 1970 from a population of Bambuti pygmies in Zaire, 14 positive samples for HTLV-2 [20]. This study has shown that HTLV was an ancient African virus already circulating in the community and not a new virus imported from the West.

Table 1. Grading of the studies included in the review.

Study	Random sampling	Sample sizing	Study in DRC	HTLV	Subject description	Total
Goubau P. <i>et al.</i> [20]		√	√	√	√	4/5
Kayembe K. <i>et al.</i> [19]		√	√	√	√	4/5
Mouliia-Pelat J.P. <i>et al.</i> [22]	√	√	√	√	√	5/5
Jeannel D. <i>et al.</i> [21]	√	√	√	√	√	5/5
Goubau P. <i>et al.</i> [23]	√	√	√	√	√	5/5
Delaporte E. <i>et al.</i> [24]	√	√	√	√	√	5/5
Tshala K.D. <i>et al.</i> [25]		√	√	√	√	4/5

Table 2. Presentation of data from included studies.

Study	Years	City	Number of patients included	Number of female patients	HTLV prevalence
Goubau P. <i>et al.</i> [20]	1970	Bambutu, Zaïre	102		14 (14%)
Kayembe K. <i>et al.</i> [19]	1990	Lisala, Equateur, Zaïre	32°	20	25 (96%)
Mouliia-Pelat J.P. <i>et al.</i> [22]	1990	Kikaoula et Sangha, Zaïre	230 pygmies 680 bantus		8.3% 5.5%
Jeannel D. <i>et al.</i> [21]	1990	Inongo, Zaïre	1162	631	36 (3.1%)
Goubau P. <i>et al.</i> [23]			4630		185 (4.0%)
Delaporte E. <i>et al.</i> [24]		Zaïre	1183 PS 1166 Ø	1183 1166	86 (7.3%) 42 (3.7%)
Tshala K.D. <i>et al.</i> [25]	1998	Pindi, Zaïre	41	41	0

°: Patients screened for chronic symmetrical spastic paraparesis; Ø: Pregnant women.

Jeannel D. *et al.* conducted a study in Inongo, Bandundu province in Zaire in 1990. One thousand one hundred and sixty-two (1162) patients, including 631 women, were included in the study to look for markers of HTLV in this heterogeneous population. Thirty-six (36) patients, or 3.1%, were positive for anti-HTLV-1 markers, giving a rural prevalence of 3.1% for this infection [21].

The same year, Moulia-Pelat JP *et al.* conducted two consecutive studies, one on 230 pygmies and the other on 680 Bantu, for the search for markers of HTLV. The prevalence of HTLV markers was 8.3% and 5.5%, respectively, in Pygmies and Bantu. This study demonstrated that HTLV infection was more prevalent in this population than HIV infection, which was 0.9% and 5.4% respectively in Pygmies and Bantu; as well as, although immune to infections such as HIV (0.9%), pygmies are more affected by HTLV through vertical transmission [22].

According to the study carried by Goubau P. *et al.* in 1993, in 3 different countries with 4630 samples, there were more cases of HTLV-1 (168 cases, 3.6%) than HTLV-2 (2 cases, 0.04%) given that HTLV-1 is more diagnosed in drug addicts in the literature [23]. According to the different regions, the prevalence of HTLV varied between 1% among pregnant women in Kinshasa and 15% among blood donors in Basankusu for Zaire, mainly in the populations of pregnant women, blood donors and sex workers [23].

In 1995, Eric Delaporte *et al.* worked in the Bas-Congo and Bandundu regions, 2349 samples based on 1166 pregnant women and 1183 prostitutes. 43 cases (3.7%) of pregnant women and 86 cases (7.3%) of prostitutes were diagnosed positive for HTLV [24]. These data add to the literature when they talk about the different means of transmission of HTLV apart from maternal-fetal and sexual transmission [24].

Between 1994 and 1998, 41 samples from women with spastic paralysis of the lower limbs were collected by Tshala K.D. *et al.* as part of the Konzo Project study to determine the involvement of HTLV [25]. After analysis by ELISA and western blot, no sample was positive for HTLV [25].

Although often asymptomatic, HTLV infection presented as a public health problem for the DRC during the nineties. Its prevalence over the decade, according to the data collected in the different populations, varied between 1% and 15%. During the same period, infection with the Human Immunodeficiency Virus (HIV), which was also prevalent, and often confused with HTLV, had a prevalence that varied between 4.2% and 6.8% [22] [26] [27] [28].

4. Conclusion

This analysis shows that the HTLV infection was indeed a reality in the Democratic Republic of the Congo as well as the HIV infection. It was interesting in the nineties. Its prevalence in this decade was between 1% and 15% in the Democratic Republic of the Congo while that of HIV was between 4.2% and 6.8% during the same period. However, since 1999, there have been no studies carried out on the carrying of HTLV. The epidemic has lost its value and been forgotten,

but that does not mean that it no longer exists or it has been eradicated.

Conflicts of Interest

The authors declare no conflicts of interest.

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