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Socio-Demographic, Biological, and Therapeutic Characteristics of People Living with HIV under Care at the Outpatient Treatment Center in Pointe-Noire, Republic of the Congo

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Abstract

HIV infection remains a major public health problem in sub-Saharan Africa. The current challenge remains screening and access to treatment. This study aimed to describe the sociodemographic, therapeutic, and biological characteristics of HIV patients followed at the Pointe-Noire outpatient treatment center. This was a descriptive cross-sectional study conducted from September to December 2025 among 150 patients. Data were obtained from medical records and questionnaires. The population was predominantly female (72.7%) and young (20 to 39 years old), with a mean age of 36.11 ± 9.8 years, extremitie ranging from 20 to over 50 years. Unmarried patients accounted for 84.0% of cases, and 56.7% had tattoos; 47.33% had a primary school education, and 46.01% had a secondary school education. The majority of patients (92.0%) were receiving antiretroviral therapy. TDF + 3TC + DTG was the primary treatment regimen used by 45.7% of the subjects. Virologic monitoring was well maintained, with over 76.0% of patients having a CD4 count ≥ 500 cells/μL and 72.0% having an undetectable viral load. The virologic profile observed in our patients indicated good immunovirologic status.

Keywords

People Living with HIV, Antiretroviral Therapy, CTA, Pointe-Noire

1. Introduction

Infection with the human immunodeficiency virus (HIV) remains a major global public health challenge, with a disproportionate burden borne by sub-Saharan Africa. According to the latest estimates from UNAIDS, approximately 39 million people were living with HIV in 2023, more than 65% of whom resided in sub-Saharan Africa, a region that also accounts for the majority of new infections and AIDS-related deaths [1].

The introduction and widespread adoption of combination antiretroviral therapy (ART) have profoundly transformed the prognosis of HIV infection, enabling sustained suppression of viral replication, gradual restoration of immunity, and a significant reduction in viral transmission [2]. Currently recommended first-line treatment regimens rely primarily on integrase inhibitors, particularly dolutegravir, due to their high virologic efficacy, superior genetic barrier, and favorable tolerability profile [3] [4].

However, despite these advances, the immunovirological response to ART remains heterogeneous. Several studies have shown that sociodemographic, clinical, and behavioral factors such as age, sex, duration of infection, treatment adherence, risky sexual practices, and certain socioeconomic determinants significantly influence immune recovery and long-term virological control [5] [6].

In resource-limited countries, particularly in Central Africa and the Republic of the Congo, recent data that comprehensively describe the clinical, biological, and behavioral profiles of people living with HIV remain relatively scarce. This lack of up-to-date local data limits the ability to accurately assess the actual effectiveness of the treatment strategies implemented and hinders the adaptation of public health policies to local realities [7] [8].

Furthermore, the combined measurement of viral load and CD4 lymphocyte count remains a key indicator for evaluating the performance of HIV care programs. Sustained virological suppression, defined as an undetectable viral load, is now recognized not only as a marker of individual treatment success but also as a major driver of population-level prevention, in line with the "U = U" (Undetectable = Untransmittable) concept [9] [10].

In this context, analyzing patient records from healthcare facilities is a useful approach for documenting patient characteristics and assessing laboratory test results and treatment adherence. Thus, the aim of this study was to describe the sociodemographic, biological, and therapeutic characteristics of HIV patients receiving care at the Pointe-Noire outpatient treatment center.

2. Materials and Methods

2.1. Study Design and Participants

This was a descriptive cross-sectional study conducted at the Outpatient Treatment Center (CTA) in Pointe-Noire, Republic of the Congo. Data were collected over a four-month period, from September 2025 to December 2025.

The study population consisted of people living with HIV (PLHIV) who were

regularly monitored at the CTA in Pointe-Noire during the study period.

2.2. Inclusion Criteria

The study included patients aged 18 years and older with a confirmed diagnosis of HIV infection who provided informed consent and had the essential biological and therapeutic data (HIV viral load, CD4 cell count, and with or without treatment) in their medical records and questionnaires.

2.3. Exclusion Criteria

The following were excluded from the study:

- Patients under the age of 18;
- Patients whose diagnosis of HIV infection was not confirmed;
- Patients who refused to participate in the study or did not sign the informed consent form;
- Patients whose medical records did not contain the essential information required for the study (HIV viral load, CD4 lymphocyte count, or treatment data);
- Patients followed at the facility but who did not meet the inclusion criteria during the study period.

2.4. Informed Consent Procedure

Prior to the start of data collection, approval had been obtained from the relevant ethics committee as well as from the heads of the participating healthcare facilities.

Potential participants were identified among patients living with HIV who were being treated at the Pointe Noire Outpatient Treatment Center. Each participant received clear and comprehensive information about the research objectives, the planned procedures, the expected benefits, the potential risks, confidentiality measures, and their rights as participants. We verbally explained the contents of the information sheet in local languages understood by the participant. Sufficient time was allowed for asking questions and seeking clarification before any decision to participate was made. Informed consent was obtained prior to any data collection. Participants who agreed to take part in the study signed a written consent form. The consent covered:

- The use of information contained in medical records;
- Access to the behavioral, biological, and therapeutic data necessary for the study;
- Participation in interviews or questionnaires conducted as part of the research;
- The use of the collected data exclusively for scientific purposes.

Participation was entirely voluntary. Participants had the right to refuse to participate or to withdraw from the study at any time without any impact on their medical care or the quality of care they received.

To ensure confidentiality, a unique identification code was assigned to each participant. No names or other information allowing direct identification were

included in the analysis database. Consent forms were stored separately from the research data in a secure location accessible only to the authorized research team.

The study included 150 patients living with HIV who met the eligibility criteria. The data collected were used solely for the purposes of this research and presented in aggregated form, without the possibility of identifying individual participants.

At the end of the study, the data were retained in accordance with applicable regulatory and ethical requirements.

2.5. Sampling Method

Participants were selected consecutively; a total of 170 records were reviewed, resulting in the selection of 150 participants, while 20 records were excluded.

2.6. Data Collection Method

Sociodemographic, biological, and therapeutic data were collected from patients' medical records as well as through a questionnaire administered directly to participants by our research team. Viral loads and CD4 counts were measured recently, during the study period.

2.7. Study Variables

- Sociodemographic and behavioral variables: Sex, age, marital status, education level, tattoos, and substance abuse;
- Biological variables: Viral load and CD4 count.

2.8. Data Analysis

The data were analyzed using Microsoft Excel 2016 to create tables and GraphPad Prism (version 2005, United States) to determine the frequencies of each variable.

2.9. Ethical Considerations

This study was conducted in accordance with the guidelines of the Declaration of Helsinki and was approved by the Health Research Ethics Committee (CERSA) under number 096-40CERSSA 2024.

3. Results

Sociodemographic characteristics of the patients Table 1 presents the sociodemographic characteristics of the study population. More than 72.7% (109) of the participants were female. The mean age of the patients was 36.11 ± 9.8 years, extremitie ranging from 20 to over 50 years.

Table 1. Sociodemographic characteristics of the patients.

Variable	Number of respondents (n)	Frequency (%)
Sex		
Women	109	72.7
Man	41	27.3

Continued

Age (years)		
Average ± SD	36.11 ± 9.8 years	
20 - 39	105	70.0
40 - 49	26	17.3
≥50	19	12.6
Marital status		
Not married	126	84.0
Married	18	12.0
Widower	6	4.0
Level of education		
Primary	71	47.33
High school	69	46.01
Academic	10	6.66
Behavioral data		
Tattoo	85	56.7
Drug addiction	21	14.0

The majority of the study population was single, had tattoos, and had a primary school education.

3.1. Biological Parameters

The majority of patients had a CD4 count of ≥500 cells/μL and an undetectable viral load (≤40 copies/mL) (Table 2).

Table 2. Distribution of CD4 counts and viral loads.

biological Variables	Number of respondents (n = 150)	Frequency (%)
Viral load (copies/ml)		
<40 (undetectable)	108	72.0
40 - 1000	17	11.3
1001 - 10,000	8	5.3
>10,000	17	11.3
CD4 count (cells/μL)		
<200	23	15.3
200 - 499	13	8.6
≥500	114	76.0

3.2. Treatment Regimen

The most commonly used treatment regimen was TDF + 3TC + DTG (45.7%), followed by ACRIPTEGA ± cotrimoxazole (28.3%) (Table 3).

Table 3. Distribution of treatment regimens.

	Therapeutic combination	Number of respondents (n)	Frequency (%)
-	TDF + 3TC + DTG	63	45.7
-	ACRIPTEGA + COTRIM	39	28.3
-	ABC + 3TC + DTG	14	10.1
-	KIVEXA + DTG	9	6.5
-	Others	13	9.4
	Without treatment	12	8.0

TDF: Tenofovir disoproxil fumarate; **3TC**: Lamivudine; **DTG**: Dolutegravir; **Cotrim**: Cotrimoxazole + Trimethoprime; **ABC**: Abacavir.

4. Discussion

The purpose of this study was to describe the sociodemographic, biological, and therapeutic characteristics of HIV-positive patients receiving care at the Pointe-Noire outpatient treatment center. Women constituted the majority of the study population, at 72.7%. This finding is consistent with the results obtained by Ndziessi *et al.* (2025) in the Republic of the Congo, who reported a female proportion exceeding 65% in a similar cohort [11]. Similarly, Yotebieng Marcel *et al.* (2023), in the CA-IeDEA cohort in Central Africa, observed a majority of women among the patients followed [12]. Global data from UNAIDS also confirm that women account for nearly 63% of people living with HIV in sub-Saharan Africa. Conversely, studies conducted in the United States and France, notably by Andrew Trickey *et al.* (2023), show a male predominance, linked to key populations (MSM) [13]. In our context, this difference can be explained by women's biological vulnerability, socioeconomic inequalities, and greater use of health services (PMTCT). The mean age was 36.11 ± 9.8 years, with a predominance of individuals aged 20 - 39, confirming a young population. This finding is similar to that of Yotebieng Marcel *et al.* (2023), who reported a mean age of approximately 35 years in cohorts from Central Africa [12]. Similarly, Kharsany *et al.* (2016) showed that the epidemic in sub-Saharan Africa primarily affects those aged 15 - 49 [14]. In contrast, Andrew Trickey *et al.* (2023) reported a higher average age (>40 years) in high-income countries [13]. This trend can be explained by high viral circulation among young people, high levels of unprotected sexual activity, and urban mobility.

The majority of patients in our study (84.0%) were single. This proportion is higher than those reported in several recent studies conducted in sub-Saharan Africa. For example, Bvochora *et al.* (2021) in Zimbabwe reported a proportion of

single individuals of 52.4% [15]. Similarly, Yosef *et al.* (2022) in Ethiopia found that 41.3% of HIV-infected patients were single [16]. Our result is also higher than that of Tolmay *et al.* (2022), who, in a multicenter analysis, showed that the proportion of unmarried individuals in their cohorts ranged from 35% to 60% [17].

In our context, this high proportion of single individuals is the probability reflect relationship instability, a higher frequency of casual partners, and increased exposure to risky sexual behaviors. Nevertheless, marital status alone does not fully explain the risk of HIV transmission, as this risk is also influenced by sexual practices, the level of prevention, and access to testing. The majority of participants had low or intermediate levels of education, with 47.33% having a primary education and 46.01% a secondary education; this finding is similar to that reported by Yosef *et al.* (2022), who showed that the majority of patients being treated for HIV have an educational level at or below the secondary level, accounting for more than 73.8% of their cohort; Elenga Ike *et al.*, (2026) also reported a more or less similar result [16] [18].

This finding can be explained by the urban sociodemographic structure, as well as by the specific relational dynamics of populations affected by HIV. Drug use was reported in 14% of cases, consistent with the findings of Degenhardt *et al.* (2023), which showed that transmission in Africa is predominantly sexual, unlike in Europe [19].

Our study reported a virological suppression rate of 72.0%. This result is similar to that reported by Dorward *et al.* (2023) in a meta-analysis showing a suppression rate between 65% - 85%. Similarly, Phillips *et al.* (2022) reported a suppression rate of 91% for patients on dolutegravir in South Africa [20] [21].

However, Kerschberger *et al.* (2022) reported a treatment failure rate of 60% and a high viral load in approximately 66% of cases [22]. The significant virological suppression observed in this study reflects good treatment adherence and the overall efficacy of the treatment regimen; however, virological non-suppression persisted in 27.9% of the study population.

The high proportion of patients with a CD4 count ≥ 500 cells/mm^3 in our study—76.0%—is higher than that reported in several previous studies conducted among people living with HIV. Indeed, Siedner *et al.* (2022), in a multicenter study conducted in sub-Saharan Africa among patients initiating antiretroviral therapy, reported that approximately 32% of patients still had a CD4 count < 200 cells/mm^3 at the start of treatment, reflecting late diagnosis and advanced immunodeficiency. The proportion of subjects with CD4 counts ≥ 500 cells/mm^3 remained lower than that observed in our study. Similarly, Dorward *et al.* (2023) demonstrated, in recent African cohorts on antiretroviral therapy, a gradual improvement in immune recovery due to early initiation of treatment. The authors reported that nearly 58% - 65% of the patients followed achieved CD4 counts ≥ 500 cells/mm^3 after effective treatment, although these values remained lower than the 76% found in our study [20] [23].

This difference could be explained by current improvements in screening strat-

egies, broader access to antiretroviral therapy, the introduction of dolutegravir-based treatment regimens, and earlier follow-up of patients living with HIV in our setting. Recent recommendations from the World Health Organization now favor immediate initiation of treatment upon HIV diagnosis, which contributes to better immunological recovery. Thus, the high proportion of patients with a CD4 count ≥ 500 cells/mm^3 in our study may reflect a significant improvement in the immunovirological management of people living with HIV compared to older cohorts. The predominance of TDF + 3TC + DTG and ACRIPTEGA is consistent with the recommendations of the World Health Organization (2022) [2].

Dorward *et al.* (2023) and Venter *et al.* (2019) demonstrated that dolutegravir improves viral suppression, reduces treatment failure, and has a strong genetic barrier [20] [24]. Kamangu *et al.* (2021) in the Democratic Republic of the Congo observed widespread use of efavirenz in first-line treatment regimens, which contrasts with our findings [25]. This difference can be explained by the implementation of a new treatment regimen proposed by the WHO.

This study has certain limitations, including its cross-sectional and single-center design, the relatively small sample size, and the absence of certain important clinical and therapeutic variables, such as treatment adherence or duration of follow-up. Furthermore, some behavioral data were based on patient self-reports, exposing the study to reporting bias. Despite these limitations, this study provides useful data on the sociodemographic, biological, and therapeutic profiles of HIV patients followed in Pointe-Noire.

5. Conclusion

Ultimately, this study conducted at the Pointe-Noire Outpatient Treatment Center highlights significant progress in the care of people living with HIV, particularly due to expanded access to modern dolutegravir-based antiretroviral treatments. The majority of patients demonstrate effective viral suppression and satisfactory immune recovery, reflecting the efficacy of current therapeutic strategies and improved clinical monitoring. However, the persistence of cases of viral non-suppression and incomplete immune recovery underscores the need to strengthen treatment adherence, early screening, and regular laboratory monitoring. Thus, despite the progress observed, the sustainable consolidation of epidemic control in Pointe-Noire requires continued efforts in prevention, health education, and patient support.

Authors' Contributions

Mr. KAYI De Grace Yanick was assisted by exceptional colleagues and supervisors in conducting this study. Socio-demographic data, biological, and clinical data were collected by Mr. KAYI De Grace Yanick, accompanied by Azine Jeanisca Tounga and Adamou Babangida. Statistical analyses were performed by Dr. Ghislain Loubano-Voumbi and Dr. Aladin Atandi Batchy. Data collection was carried out by Mr. KAYI De Grace, assisted by Mr. Freddy Saturnin Pouki and Mr. Andrely

Christ Ismaël Nsadi. Overall supervision was provided by Prof. Luc Magloire Anicet Boumba and Dr. Ghislain Loubano-Voumbi. Writing, Revision, and Editing: Prof. Luc Magloire Anicet Boumba and Dr. Ghislain Loubano-Voumbi, Coordination: Prof. Luc Magloire Anicet Boumba.

Conflicts of Interest

The authors declare that they have no conflict of interest.

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