EPIDEMIOLOGICAL AND CLINICAL PROFILE OF HIV-INFECTED PATIENTS FOLLOWED IN A TERTIARY HOSPITAL IN SOUTHERN ANGOLA

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Abstract

Introduction: HIV infection compromises the immune system, increasing susceptibility to opportunistic infections such as tuberculosis. This study analyzes the epidemiological and clinical profile of HIV-positive patients at the General Hospital of Benguela, Angola, during 2023. **Methods:** A descriptive, cross-sectional study was conducted with 229 HIV-positive patients monitored at the General Hospital of Benguela. Data were collected from hospital records, including demographic information, comorbidities, disease stages according to WHO classification, and treatment outcomes. SPSS software was used for statistical analysis, with frequency and percentage distributions for the variables. **Results:** Among the patients, 43.2% (99) were aged between 18-35 years, and 56.8% (130) were female. The prevalence of comorbidities was significant, with 26,6% (61) presenting tuberculosis and 39.3% (90) other opportunistic infections. Most patients (65.9%, 151) were in WHO stages II and III, and 79.5% (182) were managed on an outpatient basis, suggesting a stable clinical profile for most. **Conclusion:** The study highlights the prevalence of co-infections and the predominance of stable cases in intermediate WHO stages, emphasizing the importance of outpatient care and targeted public health strategies to improve HIV management.

Keywords: HIV, opportunistic infections, tuberculosis, outpatient care, Angola, antiretroviral therapy

Resumo

Introdução: A infecção por VIH compromete o sistema imunitário, aumentando a suscetibilidade a infeções oportunistas, como a tuberculose. Este estudo analisa o perfil epidemiológico e clínico dos doentes VIH positivos no Hospital Geral de Benguela, Angola, durante o ano de 2023. **Métodos:** Realizou-se um estudo descritivo e transversal com 229 doentes VIH positivos acompanhados no Hospital Geral de Benguela. Os dados foram recolhidos dos registos hospitalares, incluindo informações demográficas, comorbilidades, estádios da doença segundo a classificação da OMS e desfechos do tratamento. Utilizou-se o software SPSS para a análise estatística, com distribuição de frequências e percentagens para as variáveis. **Resultados:** Entre os doentes, 43,2% (99) tinham entre 18-35 anos e 56,8% (130) eram do sexo feminino. A prevalência de comorbilidades foi significativa, com 30% a apresentar tuberculose e 39,3% (90) outras infeções oportunistas. A maioria dos doentes (65,9%, 151) encontrava-se nos estádios II e III da OMS, e 79,5% (182) eram acompanhados em regime ambulatório, sugerindo um perfil clínico estável para a maioria. **Conclusão:** O estudo destacou a prevalência de coinfecções e a predominância de casos estáveis nos estádios intermediários da OMS, reforçando a importância dos cuidados ambulatórios e de estratégias de saúde pública direcionadas para a gestão do VIH.

Palavras-chave: VIH, infecções oportunistas, tuberculose, cuidados ambulatórios, Angola.

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Introduction

Since the emergence of HIV in the early 1980s, the epidemic has spread widely across all regions of the world. It is currently estimated that 39.9 million people globally are living with HIV[1]. By the end of December 2023, UNAIDS (the Joint United Nations Programme on HIV/AIDS) reported 1.3 million new HIV infections[2].

Data from studies in Latin America indicate a 21% increase in new HIV cases since 2010, with a total of 120,000 infections by 2019[3].

Africa has been profoundly affected by the HIV/AIDS epidemic over the past 30 years. Studies indicate that 18% of all people living with HIV/AIDS globally reside in South Africa, where it remains a leading cause of premature mortality[4].

In 2019, it was estimated that 26 million people were living with HIV in sub-Saharan Africa. Recent efforts have focused on establishing strategies to ensure that, by 2030, 95% of individuals living with HIV will be aware of their status, receive antiretroviral therapy, and achieve viral suppression, according to the Joint United Nations Programme on HIV/AIDS (UNAIDS)[5–7].

In 2020, UNAIDS estimated the HIV prevalence in Angola at 1.8% of the total population, identifying sex workers and incarcerated men as the most affected groups. In the same year, 340,000 children and adults were living with HIV, with an annual incidence of 22,000 new infections, and 33% of those infected were receiving antiretroviral treatment[8].

The Human Immunodeficiency Virus (HIV) represents one of the greatest global public health challenges. According to recent estimates, approximately 37.9 million people were living with HIV worldwide by 2019, and annually, more than 770,000 people died from AIDS-related illnesses[9–11].

Sub-Saharan Africa remains the most severely affected region, harboring approximately 70% of people living with HIV globally. Key characteristics of this epidemic include the high genetic diversity of HIV-1 and the presence of recombinant forms of the virus, which pose significant challenges to treatment and prevention programs[11,12].

In Angola, the prevalence of HIV in the adult population is estimated at around 2%, corresponding to approximately 220,000 people living with the virus (10,13). Data indicate that the genetic diversity of HIV-1 in the country is notable, with the circulation of several group M subtypes, including C, F1, G, and recombinants such as CRF02_AG, as well as unique and unclassified forms (URFs) (11,12). These patterns of genetic diversity reflect both the complexity of the epidemic in the country and interactions with neighboring countries such as the Democratic Republic of Congo and Zambia[12].

The number of new infections per year is estimated at approximately 16,000, corresponding to about 44 new infections daily (10,12). Additionally, the annual number of deaths related to HIV is estimated at around 13,000[12,13].

The most affected age group in Angola is youth aged 15 to 24, with a particularly high prevalence among young women, highlighting the vulnerability of this group due to biological, social, and cultural factors. Young women have incidence rates four times higher than men in the same age group and overall, females are the predominant sex among individuals affected by HIV in the country[10,12].

Antiretroviral resistance is a growing problem in Angola. Studies indicate that 16.3% of patients present resistance mutations to nucleoside and non-nucleoside reverse transcriptase inhibitors, even without prior exposure to medication[11,12]. Additionally, coinfection with tuberculosis (TB) and HIV is a significant challenge, with coinfection rates estimated at 12% in Luanda[9].

In Angola, despite the studies conducted on the epidemiological profile of HIV, a comprehensive understanding of its dynamics remains a challenge due to the complexity of the epidemic in the country. To contribute to advancing this knowledge, we proposed to study the epidemiological and clinical profile of HIV-positive patients treated at the General Hospital of Benguela, a tertiary-level institution.

Methods

Type of Study:

An observational, descriptive, and cross-sectional study was conducted.

Population and Study Location

The study population included all 229 HIV-positive patients who were monitored during this period, without restrictions on gender, age, marital status, clinical history, or other demographic characteristics. The study was conducted at the General Hospital of Benguela (HGB), a healthcare institution located in the city of Benguela, Angola, primarily dedicated to providing comprehensive medical care to the local population and surrounding regions.

The General Hospital of Benguela offers a wide range of medical services, including consultations, diagnostic exams, surgeries, inpatient care, and specialized treatments in various areas, such as maternity, pediatrics, gynecology, orthopedics, dentistry, and ophthalmology. Additionally, the hospital has a 24-hour emergency department, ensuring urgent and emergency care for cases requiring immediate attention.

Study Variables:

The variables in this study were defined to characterize the clinical and epidemiological profile of HIV-positive patients:

- Age Group
- Sex
- Residence
- **Occupation (High and Low Risk for HIV):**
  - High Risk: Professions with a greater likelihood of exposure to HIV due to occupational circumstances or associated behaviors. These include: Healthcare professionals, Police officers and security personnel, Sex workers, Emergency responders, Tattoo and body piercing professionals, Prison staff, Long-distance truck drivers and taxi drivers.

- · Low Risk: Professions that generally do not involve exposure to bodily fluids or high-risk behaviors in the workplace. Examples include: Office workers, Teachers, Engineers, Architects, Accountants, Librarians
- · Other administrative or technical professionals whose job functions do not entail significant contact with blood, bodily fluids, or populations at higher risk of HIV.

Malnutrition and Anemia

- · Tuberculosis and Other Opportunistic Infections
  - · Tuberculosis
  - · Other Opportunistic Infections
- · Skin Lesions
- · WHO Stage
- · Clinical Outcome

Data Collection

The data for this study were extracted from the physical records maintained in the archive room and the Voluntary Counseling and Testing Center (CATV) of the General Hospital of Benguela. All relevant information was carefully collected, verified, and entered a structured database using Microsoft Excel 365, enabling systematic data management and analysis.

The study included all patients diagnosed with HIV infection who were regularly followed up at the General Hospital of Benguela during 2023, and whose medical records contained complete information related to the study variables, such as sociodemographic data, comorbidities, disease stages (WHO classification), and treatment outcomes.

Patients were excluded if their medical records were incomplete or inconsistent, making it impossible to analyze the main variables; those who did not have continuous follow-up during 2023, such as patients transferred to other healthcare facilities or who discontinued follow-up.

Statistical Analysis

The database was created and processed using Microsoft Excel 365 and analyzed with the Statistical Package for the Social Sciences (SPSS), 29th edition. Descriptive analysis included frequency and percentage measures to characterize variables related to the epidemiological and clinical profile of HIV patients.

Ethical Considerations

The study was authorized by the Administration of the General Hospital of Benguela, and the following procedures were observed: ensuring that the information collected was used exclusively for the purposes for which it was requested, and guaranteeing the confidentiality of the data, as stipulated in the Declaration of Helsinki.

Results

Out of 229 patients followed, it was found that 99 (43.2%) are between 18 and 35 years of age, followed by 92 (40.2%) between 36 and 65 years, while individuals over 65 years of age represent 31 (13.5%), and only 7 (3.1%) are 18 years of age or younger. Regarding gender, there is a predominance of females, with 130 (56.8%), compared to 99 (43.2%) males. Most participants, 135 (59.0%), live in suburban areas, followed by 53 (23.1%) in urban areas and 41 (17.9%) in rural areas.

Regarding occupation, 129 (56.3%) of participants perform occupations classified as high risk for HIV infection, according to WHO criteria, while 100 (43.7%) are in low-risk occupations.

Regarding the clinical characteristics, it was observed that 36 (15.7%) were malnourished, and 61 (26.6%) had tuberculosis. Other opportunistic infections were identified in 90 (39.3%) of cases, while 26 (11.4%) had skin lesions, and 36 (15.7%) had anemia.

For the disease stage according to the WHO, 68 (29.7%) were in stage I, 72 (31.4%) in stage II, 79 (34.5%) in stage III, and only 10 (4.4%) were in stage IV. Regarding the clinical outcome, 182 (79.5%) were under outpatient follow-up, while 47 (20.5%) had died.

Table 1. Distribution of the population according to sociodemographic characteristics

Sociodemographic characteristics	n	%
Age group (years)		
≤18	7	3.1
18 – 35	99	43.2
36 - 65	92	40.2
≥ 65	31	13.5
Sex		
Male	99	43.2
Female	130	56.8
Residence		
Rural	41	17.9
Suburban	135	59.0
Urban	53	23.1
Occupation		
High risk	129	56.3
Low Risk	100	43.7

Table 2. Distribution of the population according to clinical characteristics

Clinical features	n	%
Malnutrition		
No	193	84.3
Yes	36	15.7
Tuberculosis		
No	168	73.4
Yes	61	26.6
Other opportunistic infections		
No	139	60.7
Yes	90	39.3
Skin lesions		
No	203	88.6
Yes	26	11.4
Anemia		
No	193	84.3
Yes	36	15.7
OMS Stage		
I	68	29.7
II	72	31.4
III	79	34.5
IV	10	4.4
Clinical Outcome		
Outpatient follow-up	182	79.5
Death	47	20.5

Discussion

The present study described the epidemiological and clinical profile of patients monitored at the General Hospital of Benguela during the year 2023. Regarding sociodemographic characteristics, most individuals were aged between 18 and 35 years (43.2%) and 36 and 65 years (40.2%), consistent with the findings of Zerdali et al,[14] and the predominant gender was female, accounting for 56.8%. These results align with those of several studies, where HIV prevalence in economically active age groups also reflects the relevance of risk behaviors in this population, as seen in the study by Dias et al[15,16]. This pattern may be related to increased exposure to risk behaviors, such as unprotected sexual relations and multiple partners, which are more common among young adults.

The high prevalence of HIV among young people, especially those aged 18 to 35, is attributed to behavioral, social, and structural factors, such as increased sexual activity, inconsistent condom use, and a lack of knowledge about prevention. Stigma and barriers to accessing condoms and sexual health services, combined with the absence of comprehensive sexual education, heighten the risk of infection. Women are particularly vulnerable due to biological and social factors, such as greater susceptibility to infection, gender inequality, and financial dependence, which hinder safe practices. Together, these factors indicate that HIV prevalence among young people and women results from complex interactions between biological and sociocultural factors. Interventions focused on women's empowerment, sexual education, and access to health services are essential to reduce this transmission.

This study also found that most individuals (59%) lived in urban areas, similar to findings from studies by Barongo et al. in Tanzania[17]. This may be because suburban areas are often inhabited by migrant populations and workers who travel to urban or suburban centers, increasing exposure to diverse social networks and reducing the stability of family and social ties factors that can influence risk behaviors. Urban areas have higher population density and movement of people, which facilitates contact and the spread of the virus. The presence of main routes also indicates increased circulation of travelers and workers, who may maintain multiple sexual partnerships across locations, thereby raising the likelihood of transmission.

This study also found that most individuals with HIV were in high-risk occupations (56.3%), consistent with studies by Zenner et al. and Gupta et al.,[18,19]. High-risk professionals for HIV include healthcare workers (doctors, nurses, laboratory technicians), emergency medical technicians and paramedics, police officers and security agents, prison workers, and cleaning and decontamination staff in medical settings. Needlestick injuries, cuts, and mucosal contact are common and represent the primary routes of occupational HIV exposure. Cleaning and decontamination staff handle waste and contaminated surfaces, where accidental exposure can occur if personal protective equipment (PPE) is not used, or strict disinfection and disposal protocols are not followed.

The results indicate that most HIV patients are under outpatient follow-up, suggesting a relatively stable or controlled clinical status. This stability is essential, as outpatient care implies that these patients do not present severe symptoms or profound immunosuppression that would require hospitalization.

The presence of tuberculosis in 30% and other opportunistic infections in 39.3% of patients indicates moderate, but not necessarily advanced, immunosuppression. This is further supported by the classification of 65.9% of patients in WHO stages II and III, which typically represents moderate infections and symptoms that, although indicative of some immune impairment, are manageable without hospitalization. These findings corroborate the results of various studies (16,20–23)

In WHO stages II and III, patients typically retain adequate functional capacity to perform daily activities and maintain some independence, provided they receive regular follow-up. These stages allow patients, even with opportunistic conditions, to benefit from outpatient prophylactic and therapeutic interventions, such as antiretroviral therapy (ART) and specific treatments for conditions like tuberculosis, thereby preventing progression to more advanced and critical stages (such as stage IV, where immunosuppression is severe, and complications are more disabling).

Thus, outpatient follow-up is an effective approach for these patients, as it allows continuous monitoring and early interventions that help prevent complications. Additionally, the outpatient model contributes to an improved quality of life, reducing the stigma associated with hospitalization and helping to minimize hospital burden.

Furthermore, conducting the study in a single hospital center limits the generalizability of the findings to other regions and institutions, as the specific characteristics of the General Hospital of Benguela, including protocols and patient profile, may not represent other settings. Data collection solely through physical records and hospital archives also introduces the risk of selection bias and data loss, potentially impacting the quality and completeness of the data analyzed.

We recognize that the definition and analysis of a comprehensive epidemiological profile involve the study of multiple factors, including social, economic, and environmental determinants, risk factors (e.g., smoking, poor nutrition, adverse environmental conditions), lifestyle habits associated with increased disease risk, and control and prevention measures. These aspects also encompass the analysis of disease incidence and prevalence, morbidity and mortality, modes of transmission, and socioeconomic impact, among others.

However, this study faced significant limitations regarding the availability and quality of hospital data, restricting the analysis to sociodemographic characteristics, co-infections, and clinical stages as defined by WHO. One of the main challenges was the absence of critical clinical data, such as CD4 count, viral load, and adherence to antiretroviral therapy. These indicators are essential for a comprehensive clinical characterization of HIV patients,

providing a precise evaluation of immune status, viral replication control, and treatment efficacy. The lack of such data constrained the analysis and hindered the ability to establish correlations between clinical variables and relevant outcomes, representing a significant gap in the holistic understanding of patients' health profiles.

Furthermore, the study did not address behavioral or socioeconomic factors, such as living conditions and support networks, which could influence clinical outcomes and treatment adherence. Lastly, the absence of longitudinal evaluation limited the understanding of patients' clinical evolution over time. We emphasize that these limitations do not reflect a lack of understanding of the complexity of the topic but rather the logistical and contextual constraints inherent to the research setting.

Future studies, particularly those with a multicenter and longitudinal design, are essential to provide a more comprehensive and representative analysis of the epidemiological and clinical profiles of HIV patients in Angola. These studies should include critical variables currently unavailable, enabling a more detailed and integrated approach to understanding the dynamics of this population.

A comprehensive epidemiological profile requires analyzing multiple factors, including social, economic, and environmental determinants, risk factors (e.g., smoking, poor nutrition, adverse living conditions), lifestyle habits, and disease control measures. It also involves assessing incidence, prevalence, morbidity, mortality, transmission modes, and socioeconomic impact.

However, this study faced significant limitations due to the availability and quality of hospital data, restricting the analysis to sociodemographic characteristics, co-infections, and WHO-defined clinical stages. A key challenge was the absence of critical clinical data, such as CD4 count, viral load, time since diagnosis, specific therapeutic regimens, ART duration, and treatment adherence. These indicators are essential for evaluating immune status, viral replication control, and treatment efficacy. Their absence limited the ability to establish correlations between clinical variables and patient outcomes, leaving a major gap in the holistic understanding of their health status.

The cross-sectional design further restricted insights into disease progression and ART effectiveness over time.

These limitations reflect not a lack of understanding of the issue's complexity but rather logistical and contextual constraints. Future studies with multicenter and longitudinal designs are essential for a more representative and comprehensive analysis of HIV patients in Angola. Incorporating currently unavailable variables, such as adherence to treatment and immune response, will enable a more integrated approach to understanding the dynamics of this population.

Conclusion

This study revealed the epidemiological and clinical profile of HIV patients at the General Hospital of Benguela, highlighting

the prevalence of coinfections, such as tuberculosis, and a concentration of patients in WHO stages II and III, suggesting a stable condition that allows for outpatient follow-up.

The analysis indicates the need for public health policies that ensure regular access to antiretroviral therapies and treatment for opportunistic infections, essential for controlling HIV and reducing its transmission.

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