

Research Article

Opportunistic Infections in People Living with Human Immunodeficiency Virus Initiating Antiretroviral Therapy in Kinshasa, Democratic Republic of Congo

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Abbreviations

ART: Antiretroviral Treatment; **ARV:** Antiretroviral; **DRC:** Democratic Republic of Congo; **DTG:** Dolutegravir; **HIV:** Human Immunodeficiency Virus; **OI:** Opportunistic Infection; **OTC:** Outpatient Treatment Center; **PLHIV:** Person Living with Human Immunodeficiency Virus

Introduction

The control of the infection with the Human Immunodeficiency Virus (HIV) knows today great hopes in patients care and management. Indeed, the advent of Anti Retroviral Treatments (ART) has made it possible to modify the natural history of the infection. The ARTs used today allow a significant improvement in the survival of People Living with HIV (PLHIV), a slowing down of immune degradation, as well as a spectacular reduction in the frequency of Opportunistic Infections (OI) [1,2]. The latter constitute the main part of the symptomatology of HIV infection responsible for a heavy mortality and morbidity of PLHIV, especially in developing countries [2]. Most OIs respond to specific treatment. The effectiveness of this treatment is closely linked to the precocity of its initiation and to immune restoration thanks to the triple therapy [3].

Abstract

Background: Opportunistic infections, which are still a major problem in the care of People Living with HIV (PLHIV), occur in situations of immunosuppression.

Objective: The objective of this study was to determine the profile of Opportunistic Infections in People Living with HIV starting Antiretroviral Treatment (ART) in Kinshasa during the Dolutegravir era.

Methods: The present study is a descriptive cross-sectional study to determine the profile of OIs among PLHIV starting ART in Outpatient Treatment Centers (OTC) in Kinshasa. Sixteen OTCs had been included in the study. The patient inclusion period in the study was from October 04, 2021 to February 15, 2022. The population of the present study was patients over the age of 18 at inclusion, infected with HIV-1 and starting ART in a selected OTC.

Results: 119 patients were included in this study respecting the inclusion criteria. 56.3% of patients included are women. The mean age on D0 is 39.87 ± 12.36 years. The most represented age group is that of 36 to 45 years with 37 patients (31.9%). The Opportunistic Infections most found in these PLHIV are: Malaria with 54 cases (45.4%), Tuberculosis (29.4%) and Cutaneous pruritus (23.5%).

Conclusion: In this cohort of patients starting ARV treatment in Kinshasa, the most common opportunistic infections are Malaria, Tuberculosis and Cutaneous Pruritus.

Keywords: Opportunistic infections, ART initiation, PLHIV, Kinshasa

OIs occur in PLHIV in situations of immunosuppression that are often caused by late treatment or rupture of Antiretroviral (ARVs). ART makes it possible to make the viral load permanently undetectable and to maintain or restore immunity, which means that in the absence of treatment or when the virus becomes resistant; the multiplication of the virus is therefore inevitable and people face a drop in their immune defenses leading to immunodeficiency [4]. It is in this situation that OIs are declared and lead to Acquired Immunodeficiency Syndrome (AIDS).

In sub-Saharan Africa, which is the region most affected by HIV infection, the number of studies on HIV and related infections conducted over the past 25 years is very low compared to Europe and America [5]. In the Democratic Republic of Congo (DRC), OIs are still a major problem in the care of PLHIV [6]. In different centers, this management is often limited to the treatment of OIs. Some local studies have shown that Tuberculosis, Candidiasis, pneumonia and malaria are the most common infections in the population [7-11]. Nevertheless, knowledge about OIs at the start of ART is still limited in Kinshasa, especially since the introduction of Dolutegravir in the care of PLHIV.

Hence the objective of this study is to determine Opportunistic

Infections in People Living with HIV starting Antiretroviral Treatment in Kinshasa in the era of Dolutegravir.

Methods

Study Design, Patient and Sample Setting

The present study is a descriptive cross-sectional study to determine the profile of Opportunistic Infections (OI) among People Living with HIV (PLHIV) who starts ART in HIV Outpatient Treatment Centers (OTC) in Kinshasa. Sixteen (16) OTCs were included in the study because of their expertise in the care of PLHIV and their accessibility [12]. The patient inclusion period was from October 04, 2021 to February 15, 2022.

Data on opportunistic infections were recorded on the study sheets previously tested by the study team.

Study population

The population of the present study was patients over 18 years of age at inclusion, infected with HIV-1 and initiating ART in a selected OTC during the inclusion period. Patients were included on the following criteria: to be diagnosed as PLHIV at the OTC, to be at least 18 years old at inclusion and naïve to ART.

Parameters of interest

The parameters of interest monitored for the present study were age, sex, opportunistic infections and conditions found in PLHIV as well as clinic of patients at the inclusion (D0).

Operational definitions

An opportunistic infection is an infection due to germs that are usually not very aggressive but whose pathogenicity is amplified by the patient's deficient immune system, his sensitivity to infections.

Ethical consideration

This study has been approved as a whole by the research ethics committee of the School of Public Health, Faculty of Medicine, University of Kinshasa (ESP/CE/115/2021). Authorization to access the OTCs has been taken from the managers of the various centers included. Prior to inclusion, fully informed consent was obtained from each participant.

Statistical analyzes

The analyzes were carried out using SPSS software version 26 (Statistical Package for Social Sciences, IBM). Only available data were analyzed, missing data were considered completely random. Correlations were sought using Pearson's correlation test.

Results

One hundred and nineteen (119) patients were included in this study respecting the inclusion criteria. Fifty-two (52) patients, or 43.7%, included in the study are men while 67 patients (56.3%) are women; thus giving a sex ratio of 1.29 in favor of women.

The average age of patients included on D0 is 39.87 ± 12.36 years with extremities of 18 to 69 years. The most represented age group is that of 36 to 45 years with 37 patients (31.9%) followed by that of 26 to 35 years with 24 patients (20.7%), that of 46 to 55 years with 22 patients (19.0%) and that of 18 to 25 years with 19 patients (16.4%). These data are presented in Table 1.

Table 1: Distribution of the population by sex and age group.

Parameters	Patients	
	Values	Percentage
Sex (N = 119)		
Female	67	56.3
Male	52	43.7
Age Interval (N = 116)		
18-25	19	16.4
26-35	24	20.7
36-45	37	31.9
46-55	22	19.0
56-65	11	9.5
>65	3	2.5

Table 2: Clinical aspects of patients on D0.

Clinics of patients	Frequencies	Percentage
Clinical Stage according to WHO (N = 118)		
Stage 1	40	33.9
Stage 2	18	15.3
Stage 3	49	41.5
Stage 4	11	9.3
Clinical Status of patient (N = 117)		
Normal	55	47.0
Good	39	33.3
Bad	22	18.8
Pre-moribund	1	0.9
Moribund	0	0

Forty-nine patients (49), or 41.5%, were at clinical stage 3; followed by 40 patients (33.9%) who were at clinical stage 1, 18 patients (15.3%) at clinical stage 2 and 11 patients (9.3%) at clinical stage 4. Fifty-five (55) patients, or 47.0%, had a normal clinical condition; followed by 39 patients (33.3%) who had a good clinical state, 22 patients (18.8%) a bad clinical state and 1 patient (0.9%) a pre-moribund clinical state. Table 2 presents the clinical aspects of the patients.

The Opportunistic Infections most found in PLHIV starting ART are: Malaria with 54 cases (45.4%), Tuberculosis (29.4%), Cutaneous pruritus (23.5%), urinary tract infections (21.8%), oral candidiasis and skin eruptions (20.2%). Table 3 presents the exhaustive list of OIs found.

Some correlations were observed between the clinical stages of patients and certain OIs such as Oral Candidiasis (0.215; $p=0.023$), Vaginal Pruritus (0.188; $p=0.044$), Diarrhea (0.221; $p=0.017$), Tuberculosis (0.422; $p<0.000$) and Dermatitis (0.198; $p=0.033$).

Discussion

The objective of this study was to determine the profile of Opportunistic Infections in People Living with HIV (PLHIV) starting ART in the OTCs of Kinshasa in the era of Dolutegravir. According to the criteria, 119 PLHIV were included for this study initiating treatment in 16OTCs disseminated in the four districts of Kinshasa.

Table 3: Opportunistic infections encountered in patients on inclusion.

Parameters	Patients (N = 119)	
	Values	Percentage
Oral candidiasis	24	20.2
Vaginal mycosis	13	10.9
Vaginal pruritus	16	13.4
Cutaneous pruritus	28	23.5
Shingles	4	3.4
Skin rash	24	20.2
Dermatitis	18	15.1
Diarrhea	17	14.3
Intestinal parasitosis	12	10.1
Rhinitis	11	9.2
Tuberculosis	35	29.4
Malaria	54	45.4
Urinary tract infection	26	21.8
Non-specific STI	5	4.2
Others	11	9.2

Fifty-two (52) patients, or 43.7%, included in the study are men while 67 patients (56.3%) are women; thus giving a sex ratio of 1.29 in favor of women. The predominance of the female sex in the present cohort corroborates the data found in the literature for Kinshasa [13-15].

The average age of patients included on D0 is 39.87 ± 12.36 years with extremities of 18 to 69 years. The most represented age group is that of 36 to 45 years with 37 patients (31.9%) followed by that of 26 to 35 years with 24 patients (20.7%), that of 46 to 55 years with 22 patients (19.0%) and that of 18 to 25 years with 19 patients (16.4%). This predominant age group is recognized as the one in which the population is more sexually active. These results are similar to those published by various authors in Kinshasa who presented a similar average age in the populations of PLHIV and the dominant age group of 25 to 45 years [7-11,13-18].

Forty-nine patients (49), or 41.5%, were at clinical stage 3; followed by 40 patients (33.9%) who were at clinical stage 1, 18 patients (15.3%) at clinical stage 2 and 11 patients (9.3%) at clinical stage 4. Fifty-five (55) patients, or 47.0%, had a normal clinical condition; followed by 39 patients (33.3%) who had a good clinical state, 22 patients (18.8%) a bad clinical state and 1 patient (0.9%) a pre-moribund clinical state. These results have also been presented by various authors [13-18]. This late diagnosis of patients, generally in an advanced stage, has an impact on the management and prognosis of the follow-up of PLHIV.

Malaria was the most common OI in PLHIV starting ART with 54 cases (45.4%), followed by Tuberculosis (29.4%), skin pruritus (23.5%), urinary tract infections (21.8%), oral candidiasis and skin eruptions (20.2%), dermatitis (15.1%), diarrhea (14.3%), vaginal pruritus (13.4%), mycosis vagina (10.9%), intestinal parasites (10.1%), rhinitis (9.2%), non-specific sexually transmitted infections (4.2%), and shingles (3.4%). The same infections are presented by different authors for Kinshasa but in different orders [6-11,19]. Nevertheless, it is retained that in our environment, Malaria, Tuberculosis and

Oral candidiasis are the OIs most found in PLHIV because of the immunosuppression caused by HIV in the patient.

Some correlations were observed between the clinical stages of patients and certain OIs such as Oral Candidiasis (0.215; $p=0.023$), Vaginal Pruritus (0.188; $p=0.044$), Diarrhea (0.221; $p=0.017$), Tuberculosis (0.422; $p<0.000$) and Dermatitis (0.198; $p=0.033$). These correlations can be explained by the fact that these infections are generally linked to a balance of the microbial flora which, once disturbed by immunosuppression, gives way to a multiplication of infectious germs.

Conclusion

In this cohort of patients starting ARV treatment in Kinshasa, the most common opportunistic infections are Malaria, Tuberculosis and Cutaneous Pruritus.

Conflict of Interest

The authors declare no conflict of interest for the publication of this study.

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Contribution of the Authors

EKN, BBI: design of the research project. **GBM, MTS:** reading and amendment of the research project. **BBI, TNK, LLO, GBI, NDM, RDD, SSM, JNE, CKA:** data collection and analysis. **EKN, GBM, MTS, BKO:** analysis and interpretation of data. **EKN, TNK:** drafting of the first manuscript. **BBI, GBM, MTS, BKO:** critical review of the final version of the article. All authors have read, corrected and approved the final version of the manuscript.

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