

# Opportunistic Infections in Patients Living with HIV at Brazzaville University Hospital: Prevalence and Associated Factors

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**Abstract Objectives:** To determine the prevalence of opportunistic infections in the Infectious Diseases Department and to look for associated factors. **Patients and Methods:** A descriptive and analytical retrospective study of patients living with HIV, diagnosed in pre- or per-hospitalization, receiving or not receiving highly active antiretroviral therapy, in which an opportunistic infection related to AIDS has been documented. **Results:** A total of 548 patients included (22.7% of admissions) of average age of  $39.9 \pm 11.2$  years (17-82 years), mostly female (n=339; 61.9%), singles (n=403; 73.5%), with a primary education level (n=218; 39.8%). The majority (n=403; 73.5%) came from an urban area, with a primary education level (n=218; 39.8%), residing in cities (n=403; 73.5%). 77 Patients working in the informal sector were overwhelmingly represented (n=357; 65.1) followed by the unemployed (n=51; 9.3%). The average consultation time was  $29 \pm 3.5$  (6-42) days. Type 1 HIV was the most found (419; 78.1%) and Lower CD4 < 200/mm<sup>3</sup> in 93 patients. The most common opportunistic infections found were Tuberculosis (n=231; 42.2%), Toxoplasmosis (n=85; 15.5%) and Neuromeningeal Cryptococcosis (n=58; 10.6%). Only 381 patients were on ARTV (69.5%), first-line (n=124; 74.3%). The average length of hospital stay was 20.4-11.8 (5-60) days. The overall lethality was 68%. **Conclusion:** Opportunistic infections remain common at the Brazzaville University Hospital in an HIV-depressed population. Tuberculosis affects lethality, which is high as a result of therapeutic non-compliance. This is to say the importance of early HIV testing and management to minimize the emergence of opportunistic diseases in this area.

**Keywords:** opportunist, HIV, prevalence, associated factors, CHU, Brazzaville

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## 1. Introduction

Despite the advent of highly active ART, HIV infection remains a major public health problem worldwide and especially in South Saharan Africa [1]. In 2018, 32 million (23.6 million-43.8 million) people have died as a result of AIDS-related diseases since the beginning of the epidemic and 23.3 million (20.5 million-24.3 million) people living with HIV had access to antiretroviral treatment, an increase of 7.7 million (6.8 million-8.0 million) in 2010 [1]. Despite this progress, people continue to die from AIDS and tuberculosis remains the leading cause of death among people living with HIV (PHA) accounting for about one in three deaths [1,2]. In Congo, tuberculosis remains the leading cause of death for PHAs in alarming

proportions [2]. This during the share of each opportunistic infection in the morbidity and hospital mortality of patients has not been made to our knowledge where see few studies carried out. The objective of this work was therefore to determine the frequency of opportunistic HIV-related infections in a reference hospital structure in the management of this infection, and then to identify factors associated with the death of HIV these patients.

## 2. Patients and Methods

This was a cross-section with a descriptive and analytical purpose of opportunistic infections documented and recorded in the Infectious Diseases Department of the University Hospital of Brazzaville between the period from January 1, 2012 to December 31, 2018.

The study included HIV-suppressed patients of any type, screened in pre- or per-hospitalization, or not receiving highly active antiretroviral therapy. Epidemiological variables (age, sex, socioeconomic level, marital status, place of residence, educational attainment) clinical (type of opportunistic infection), diagnostic (type of HIV, CD4, examination in relation to the type of IO), therapeutic (type of ART, chemoprophylaxis of IO) that are progressive (duration of hospitalization, cure, death, causes of death) have been studied. The data were collected using a survey sheet developed for this purpose, processed and analyzed on epi-info 3.5.1.

Quantitative variables were expressed on average and standard deviation, followed by qualitative variables in numbers and percentages. Pearson's Chi-two (x2) test was used to compare qualitative variables when conditions were met, or Fischer's Chi-two if any. The comparison of quantitative variables was made with the Student test. Logistic regression was carried out because the variable of

interest was dichotomous. The required significativity threshold was 5%.

### 3. Operational Definitions

Adherence to ART was considered poor when the patient:

- had failed to take his treatment for more than 72 hours;
- reduced the handling times without the notice of the prescriber;
- Stopped treatment for adverse effects in the prescriber's opinion;
- In addition to ARVs, took herbal life stakes from traditional manufactures.

### 4. Results

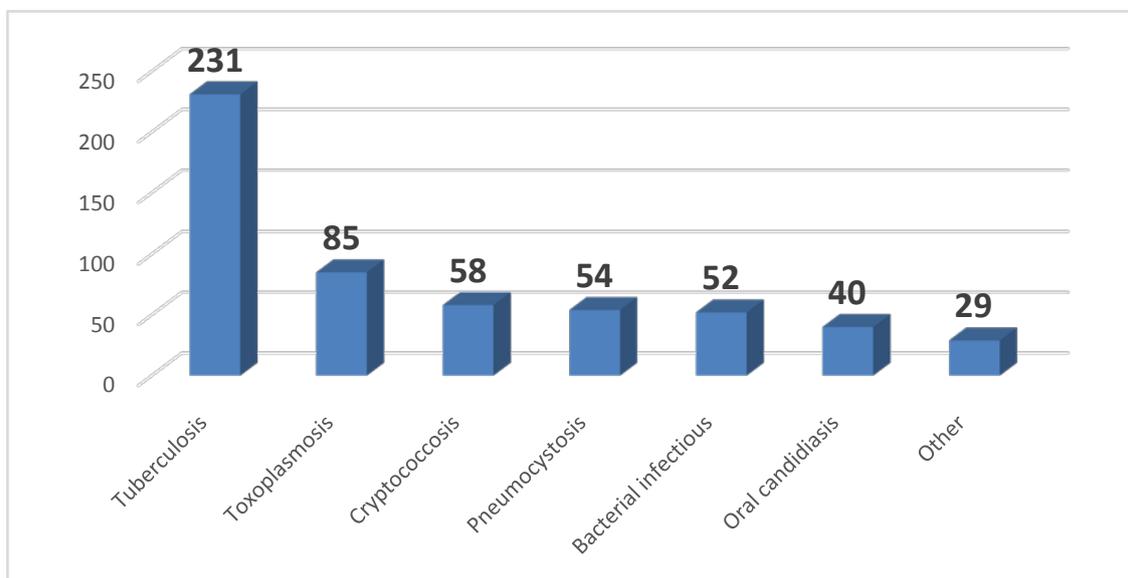


Figure 1. Major opportunistic infections

Table 1. Factors related to death

Death	OR brute	IC 95%	P	OR ajusté	IC95%	p
Sex						
Female						
Male	1,7	[1,2 – 2,5]	0,008	4.356249	[2,3 – 8,4]	p<0,001
CD4 rate						
Realized						
No realized	2,24	[1,5 – 3,4]	0,000	2.32831	[1,2 – 4,5]	p<0,05
Observance						
Good						
Bad	9,38	[5,9 – 14,7]	0,000	5.43655	[2,8 – 6,7]	p<0,001
IO Pulmonary						
Tuberculosis	3,8	[2,5 – 5,9]	0,000	3.566652	[1,9 – 6,6]	p<0,001
Pneumocystosis	0,1	[0,01 – 1,7]	0,421	4.034908	[0,0 – 5,4]	
Bacterial infections	0,8	[0,4 – 1,7]	0,589	1.193172	[0,4 – 3,2]	
Neuromeningical IO						
Cryptococcosis	0,53	[0,3 – 1,1]	0,088	0.700102	[0,2 – 2,0]	
Toxoplasmosis	0,34	[0,2 – 2,3]	0,866	2.311945	[0,8 – 6,7]	
Tuberculosis N M	1,06	[0,5 – 2,3]	0,003	2.867857	[1,1 – 8,2]	p<0,05
LEMP	1,63	[0,6 – 4,3]	0,325	1.680067	[0,5 – 6,0]	

A total of 548 patients included (22.7% of admissions) of average age of 39.9 -11.2 years (17-82), mostly female (n-339; 61.9%), male (209; 18.1) singles (n-403;73.5%), married (n-86;15.7%) and widowers (no.41; 7.5%) having a level of primary education (n-218;39.8%), out of school (n-135;24.6%), residing in the city (n-476; 88.7), and as a companion (n-57;10.4%). Patients working in the informal sector were overwhelmingly represented (n-357; 65.1) followed by the unemployed (n-51; 9.3%). Average consultation time was 29-3.5 (6-42) days; Type 1 HIV was highest (419; 78.1%), HIV 2 (n-34;6.2%), HIV1 and 2 (n-82;15%) and CD4 figures were less than 200/mm<sup>3</sup> in 93 of the 109 patients who performed the examination. In 374 patients, CD4s were not achieved (68.3%). The most common opportunistic infections found (Figure 1) were Tuberculosis (n-231; 42.2%), Toxoplasmosis (n-85; 15.5%) Neuromeningeal Cryptococcosis (n-58; 10.6%), pneumocystosis (n-54; 9.9%) and bacterial infections (n-52; 9.5%). Only 381 patients were on ARTV (69.5%), first-line (n-124; 74.3%). The average length of hospital stay was 20.4-11.8 (5-60) days. The overall lethality was 68%. The male sex (OR-1.7; IC: 1.2-2.5; (P-0.001), tuberculosis (OR-3.8; IC:2.5-5.9; P-0.000) and poor adherence to TARV (OR-9.38; IC:5.9-14.7; P-0,000) were related to the occurrence of deaths (Table 1).

## 5. Discussion

The difficulty of retrospective studies in the African context, as was the case for this work, lies in the collection of data using medical records and hospital records, sometimes justifying the missing data (clinical form of IO, age) than biological. The other challenge is the ability of officers to accurately provide data collection records. Despite these biases encountered by several authors [2,3,4], this work was able to lift the veil on the frequency of IO in the Infectious Diseases Department of the University Hospital of Brazzaville and the factors that largely justifies the fatal outcome of patients.

The frequency of IO is high at the Brazzaville University Hospital. These are predominantly female and sexually active and alone patients, in connection with UN-AIDS data on the feminization of HIV infection in Africa [1]. Urban areas are densely populated areas conducive to the transmission of both HIV infection and other opportunistic infections such as tuberculosis. These data are similar to those reported at the sub-region level [3,4,5]. The emergence of opportunistic infections is largely justified by the late detection of HIV infection and especially by the long delays in seeing patients who in certain situations are primarily present to traditional practitioners and leaders, for chronic diseases unexplained socially [3,6]. Type 1 HIV was the most found type of virus related to epidemiological or virological data of the disease in Central Africa. However, in significant proportions, there was an association of the two types of virus. This scenario often puts practitioners in a situation of therapeutic impasse in the face of the natural resistance of HIV2 to non-nucleoside inhibitors of reverse transcriptase, the only ones available in our regions for first-time treatment line [7,8].

The appearance of IO in this study is related to the degree of advanced immunodepression found in most patients. For either economic patient-related or technical reasons related to the lack of reagents in the laboratory, many patients had not performed the CD4 dosage. These difficulties are traditional in Africa south of the Sahara [3,9]. The most common opportunistic infections are classic and similar to those found in the same Service and subregion level [3,4,5,6,10]. Tuberculosis remains the first opportunistic infection among PHAs [1,2]. The long-term hospital stay in patients is largely justified by late reliance on care facilities and poverty, since the management of these conditions is not within the reach of the scholarships of patients with low levels. socio-economic [3,4]. The lethality found in this series is very high in relation to age, male sex and tuberculosis regardless of location and also to other overlying HIV comorbidities (renal failure, diabetes and others) [1,2,11]. It is also quite high in other African series. The limitation of diagnostic and therapeutic means associated with delay in patient care justifies this high fatality rate.

## 6. Conclusion

The frequency of opportunistic infections is high at the Brazzaville University Hospitals with a lethality due in large part to tuberculosis. Early and correct HIV testing and management would improve this situation

## Conflict of Interest

The authors report no conflict of interest in relation to this study.

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