



# Epidemiological and Clinical Profile and Management of Neuromeningeal Cryptococcosis in People Living with HIV in Kinshasa: Case of N'Djili General Reference Hospital

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## Abstract

**Background:** Neuromeningeal Cryptococcosis (NMC) is the most common systemic mycosis observed during infection with Human Immunodeficiency Virus (HIV); it is a very common opportunistic infection in an immune-compromised panel of advanced stage HIV infection. **Objective:** The objective is to determine the epidemiological and clinical profile of Neuromeningeal Cryptococcosis in People Living with HIV (PLHIV) in Kinshasa. **Methods:** It is a retrospective study based on the files of PLHIV with NMC followed at the Department of Internal Medicine at N'Djili General Hospital from January 2016 to December 2019. All files of PLHIV, without any discrimination, followed in the center in the selected period, duly completed, with a confirmed positive diagnosis for NMC were retained for the study. Data were collected from the patient register and patient medical records with respect for anonymity and confidentiality. **Results:** 94 cases of PLHIV with NMC were retained in compliance with the inclusion criteria, of which 64 are men (68.1%). The most represented age group was that of 35 to 40 years with 25 patients (26.59%), followed by that of 30 to 35 years (21.27%). The most frequent clinical signs at the start of treatment were: headache (20.21%), convulsion and photophobia (17.02%), and memory impairment (13.82%). Only 89.4% had a positive China's ink exam on cerebrospinal fluid. The most used medication was amphotericin B (42.55%), followed by fluconazole (31.91%).

84 cases of recovery (89.36%) were recorded during the period of the survey.

**Conclusion:** NeuroMeningeal Cryptococcosis is an opportunistic infection that mostly affects men in our midst and the age group of 36 to 40 years. The most frequent clinical sign at the start of treatment in our cohort was headache, and amphotericin is the most prescribed medication.

## Subject Areas

Epidemiology

## Keywords

Epidemiology, Clinic, Neuromeningeal Cryptococcosis, HIV, Kinshasa

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## 1. Introduction

Cryptococcosis is the most common systemic mycosis observed during Human Immunodeficiency Virus (HIV) infection, representing the third leading cause of central nervous system infections after viral encephalitis and toxoplasmosis [1]. NeuroMeningeal Cryptococcosis (NMC) is a very common opportunistic infection in an immunocompromised panel of advanced stage HIV infection [1].

In the early 1980s, a marked increase in this infection was observed linked to the HIV/AIDS epidemic around the world [2] [3]. Since its prevalence varies between 5% and 35% across the world [1]. Sub-Saharan Africa, more specifically Central Africa, bears a great burden of this epidemic around the world [3]. In the Democratic Republic of the Congo (DRC), few studies have been carried out to determine the frequency in hospital as well as the clinical profile of this infection in the population.

Hence the objective of this study is to determine the epidemiological-clinical profile of NeuroMeningeal Cryptococcosis in People Living with HIV in Kinshasa.

## 2. Methods

This study is a retrospective based on the records of People Living with HIV (PLHIV) with NMC followed at the Department of Internal Medicine at N'Djili General Hospital from January 2016 to December 2019.

All the files of PLHIV, without any discrimination, followed in the center in the selected period, duly completed, with a clinical and para-clinical diagnosis confirmed positive for NMC were selected for the study. The variables of interest were: patient's age, gender, clinical signs on admission, results of the Cerebrospinal Fluid (CSF) test by lumbar puncture with China's ink, medications used and prognosis.

The data was collected on previously tested survey forms, entered into Excel 2010, and then exported to R for statistical analysis. They were collected from the patient register and patient medical records with respect for anonymity and

confidentiality.

### 3. Results

Ninety-four (94) cases of PLHIV with NMC were retained in accordance with the inclusion criteria. Sixty-four (64) are men (68.1%) against 30 women (31.9%). The most represented age group was that of 36 to 40 years with 25 patients (26.59%), followed by that of 31 to 35 years (21.27%), that of 26 to 30 years (15.95%), those aged 41 to 45 (14.89%), and those aged 20 to 25 and over 45 (10.63%). **Table 1** describes the above data.

The most frequent clinical signs at the start of treatment were: headache (20.21%), convulsion and photophobia (17.02%), memory impairment (13.82%), stiff neck (12.76%), persistent fever (10.63%), physical asthenia (9.57%), vomiting with cough (8.51%) and loss of consciousness (7.44%). Although clinical symptoms were positive in all PLHIV, only 89.4% had a positive China's ink for CSF test. The most used medication was amphotericin B (42.55%), followed by fluconazole (31.91%), erythromycin (14.89%) and penicillin (10.63%). Eighty-four (84) cases of recovery (89.36%) were recorded during the study period. **Table 2** shows the data mentioned above.

### 4. Discussion

The objective of this study was to determine the epidemiological clinical profile of NeuroMeningeal Cryptococcosis (NMC) in People Living with HIV (PLHIV) in Kinshasa at the General Reference Hospital of N'Djili. Ninety-four (94) cases of PLHIV with NMC were retained in accordance with the inclusion criteria.

Sixty-four (64) were men (68.1%) against 30 women (31.9%); giving a sex-ratio of 1:2 (F/M). These data are similar to those of Zono *et al.* who found 65.5% of men and 34.9% of women in a study conducted in the same environment [4]. These data tend to show more CNM in male HIV patients. This confirms the theories of men's susceptibility to NMC and the idea of NMC affecting more male patients than female's [5].

**Table 1.** Patients data.

Characteristics	Frequencies
Sex	
Men	64 (68.1%)
Women	30 (31.9%)
<b>Age interval (in years)</b>	
20 - 25	10 (10.63%)
26 - 30	15 (15.95%)
31 - 35	20 (21.27%)
36 - 40	25 (26.59%)
41 - 45	14 (14.89%)
>45	10 (10.63%)

**Table 2.** Clinics and diagnosis.

Characteristics	Frequencies
Clinical signs at admission	
Trouble of memory	13 (13.82%)
Neck stiffness	12 (12.76%)
Headache	19 (20.21%)
Physical asthenia	9 (9.57%)
Loss of consciousness	7 (7.44%)
Convulsion and photophobia	16 (17.02%)
Prolonged fever	10 (10.63%)
Vomiting and prolonged coughing	8 (8.51%)
Diagnosis by China's ink staining	
Positive	84 (89.36%)
Negative	10 (10.63%)
Treatment used	
Amphotericin B	40 (42.55%)
Fluconazole	30 (31.91%)
Penicillin	10 (10.63%)
Erythromycin	14 (14.89%)

As shown in the above tables, the age group of 36 to 40 years was the most represented with 25 patients out of 94 (26.95%) and the age group of 41 to 45 was accounted for 14.89%. These data corroborate that of Zono *et al.* with the 35 to 44 age group being the most affected by CNM in a population of PLHIV in Kinshasa [4]. For all the clinical signs that were found at the start of treatment in that population, the most frequent encountered was the headache (20.21%). Although the frequencies are different, these data approximate those published by Zono *et al.* [4].

Regarding the diagnosis result, all PLHIV with CNM had the clinical symptoms accordingly, however, only 89.4% had a positive China's ink for CSF test. These figures bring back the problem of performing the CSF examination in our environment, especially in peripheral hospitals settings.

Amphotericin B (42.55%) was the most recommended and medicated treatment in this study. It was followed by fluconazole with 31.91%, erythromycin with 14.89% and penicillin with 10.63%. On the other hand, Zono *et al.* reported fluconazole as the most prescribed drug in their patient cohort [4]. This calls into question the standardization of prescriptions for PLWHIV in our community.

As for the cases of cures, eighty-four (84) cases (89.36%) were recorded during the period of the investigation. This approximates the 34.8% mortality rate data published by Zono *et al.* [4].

## 5. Conclusion

NeuroMeningeal Cryptococcosis is an opportunistic infection that mostly affects

men in our midst and the age group of 36 to 40 years. The most frequent clinical sign at the start of treatment in our cohort was headache, and amphotericin was the most prescribed drug.

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### Conflicts of Interest

The authors declare no conflicts of interest.

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### Abbreviation

CSF: Cerebro Spinal Fluid; DRC: Democratic Republic of Congo; HIV: Human Immunodeficiency Virus; NMC: Neuro Meningeal Cryptococcosis; PLHIV: People Living with HIV.