ISSN: 2577-8455

Research Article

Archives of Infectious Diseases & Therapy

Opportunistic Infections and Impact on Morbidity and Mortality During HIV in the Infectious Diseases Department at Point G Hospital in Bamako

Abdoulaye Mamadou TRAORE[1*], Garan Dabo, Hamsatou CISSE, Ibrahima I DOLLO, Charles DARA, Mahamou M KOUREICHI, Tidiane CISSE, Seydou D. OUOLOGUEM, Brehima SALL-BA, Daouda K. MINTA

[1]*Department of Infectious Diseases, CHU du Point G, Bamako, Mali*

[2]*Department of Medecine, CHU "Hôpital du Mali", Bamako, Mali*

[3]*Department of Medecine, CHU "Bocar SALL de Kati", Mali*

[*]Corresponding Author
Abdoulaye Mamadou TRAORE, Department of Infectious Diseases, CHU du Point G, Bamako, Mali.

Submitted: 2024, Feb 21; **Accepted:** 2024, Mar 29; **Published:** 2024, Apr 19

Citation: Traoré Abdoulaye, M., Dabo, G., CISSE, H., Ibrahim, D., DARA, C., et al. (2024). Opportunistic Infections and Impact on Morbidity and Mortality During HIV in the Infectious Diseases Department at Point G Hospital in Bamako. *Archives of Infect Diseases & Therapy, 8*(1), 01-05.

Abstract

Aim: *In the contexts of free treatment and the "test and treat" strategy, we conducted this study whose objectives are to identify the main opportunistic infections (OIs) and their impact on the future of HIV-infected patients.*

Patients and methods: *This was a cross-sectional retrospective study of variables from the medical records of HIV-infected person hospitalized between January 1, 2015 and December 31, 2021.*

Results: *Out of 2631 hospitalized patients, 1237 were HIV-positive (47%), 54,4% had OIs. The sex ratio was 0.86 and the mean age was 38.9 ± 10.37 years. The main opportunistic infections are candidiasis (39.32%), tuberculosis (25.25%) and cerebral toxoplasmosis (14.57%). The lethality was 43.7% (540/1237). Death was statistically related to opportunistic infections: tuberculosis ($p < 0.0001$), toxoplasmosis ($p = 0.004$), candidiasis ($p < 0.0001$) and prurigo ($p = 0.04$) and stage 4 of WHO ($p < 0.0001$) and CD4 ≤ 200 / ml.*

Conclusion: *Death was statistically related to tuberculosis, toxoplasmosis, and stage 4 of WHO deep immunosuppression and CD4 ≤ 200/ml as reported by candidiasis and prurigo. Screening and early management of opportunistic infections and even HIV will help lower mortality.*

Keywords: Opportunistic Infections, HIV, Mobidity, Mortality.

1. Introduction

Despite the progress made in the fight against HIV infection, it remains a public health problem. Moreover, the advent of triple therapy has considerably reduced mortality. With a concentrated epidemic, HIV prevalence in Mali stands at 1.1%. Despite the widespread availability of highly active antiretroviral therapy (HAART), and the extension and decentralization of care supported by the delegation of tasks [1], the number of advanced cases referred to the infectious diseases department of Bamako University Hospital continues to rise, with the attendant increase in mortality [2]. Several studies targeting opportunistic infections (OI) have reported that they are the main causes of death in of HIV-infected patients [3-7]. If they remain so, we initiated the present study. Our objectives were to determine the frequency of OI and their impact on mortality.

2. Methods

• *Study setting*

The Infectious Diseases Department of the University Hospital of Bamako, which was designated a center of excellence for adult HIV care in Mali in 2009, by the Ministry of Health's sectoral AIDS control unit, served as the study setting.

• *Type and period of study*

This is a cross-sectional study with retrospective collection of variables from hospitalization medical records at the site from January 1, 2015 to December 31, 2021. All known HIV-positive patients were included or screened following hospitalization in the

presence of suggestive signs, after counseling. Patients under 15 years of age and those who died within 24 hours of admission were not selected. Clinical course was defined according to the WHO classification of AIDS.

On admission, patients were interviewed and clinically examined. A paraclinical workup was systematically requested as part of HIV monitoring, with other paraclinical examinations left to the discretion of the physicians, depending on the patient's clinical condition. Patients initially on HAART underwent an adherence assessment and received one or more adherence enhancement sessions if necessary.

At the beginning of this study, national guidelines for HAART recommended a combination of 2 nucleoside or nucleotide reverse transcriptase inhibitors and a non-nucleoside transcriptase inhibitor for initial treatment [8]. Currently, first-line treatment is based on a combination of 2 nucleoside or nucleotide reverse transcriptase inhibitors and a integrase inhibitor [9].

• Data collection and analysis

The information collected according to the desired variables was transcribed on our questionnaires, entered, and analyzed in a database on the Epi info version 2000 software developed for this purpose. The results are presented anonymously. For the diagnoses selected, we used the International Classification of Diseases and Related Health Problems 10th revision (ICD-10) and the Infectious Diseases Thesaurus version of September 2000, adapted to the diagnostic possibilities in our context. Considering the context of comorbidity, the principal diagnosis was defined as the condition or infection which, at the end of treatment, was considered to have mobilized the most resources. Frequencies were calculated to describe the qualitative variables. The distribution of quantitative variables was described by mean ± standard deviation and extreme values. Pearson's Chi2 test or Fischer's exact test was used to compare the different proportions according to the conditions of application of the different tests. The expected threshold of significance was set at $p < 0.05$. Analysis of prognostic factors associated with death was performed in bi-variate mode using SPSS version 12.0 software.

3. Results

During the study period, 2631 patients were hospitalized, 1237 of whom were HIV-infected, representing a frequency of 47.1% in the department.

3.1. Socio-demographic data

The mean age of patients was 38.9 ± 10.37 years, and 53.7% were female, i.e. a sex ratio of 0.86. Non-civil servant employees were more numerous (59.2%) (Table 1).

Characteristics	Headcount	Percentage (%)	
Sex	Male	573	46.3
	Female	664	53.7
	Sex-ratio= 0.86		
Age	Average = 38.9 years ± 10,37 [15-81]		
	15-24 years	60	4 .9
	25-49 years	956	77.6
	50 years and over	216	17.5
Profession	Civil servant	92	7.44
	Other employees*	732	59.2
	Unemployed**	413	33.4

Table 1: Socio-demographic characteristics of the sample.

3.2. Immunovirological data

Immuno-virologically, 95.7% of patients were infected with HIV-1, 82.06% were admitted with a CD4 lymphocyte count < 200 cells/mm3 and 57.37% had a viral load ≥ 100,000 copies/ mm^3 (Table 2).

Immunovirological characteristics		Headcount	Percentage (%)
HIV serotype (n=1237)	HIV-1	1184	95.7
	HIV 2	32	2.6
	HIV 1+2	21	1.7
CD4 T cell rate (/mm^3) (n=769)	Mean= 116.7±181.73 [1-1889]		
	< 200	631	82.06

	200-499	104	13.52
	≥ 500	34	4.42
Viral load (copies/mm³) (n=248)	Average =1633352,7±7641510,417		
	< 100000	107	42.63
	≥ 100000	144	57.37
WHO stade	1	6	0.4
	2	136	11
	3	539	43.6
	4	556	44.9

Table 2: Immunovirological characteristics of patients

3.3. HAART and evolution of parameters

Therapeutically, 323 patients were never taken HAART (26.1%) compared to 914 who were treated by HAART, 63.5% of whom were on first-line therapy (2 nucleoside/nucleotide reverse transcriptase inhibitors and one non-nucleoside reverse transcriptase inhibitor), preferably Tenofovir (TDF)-lamivudine (3TC)-Efavirenz (EFV) and 10.4% second line (2 nucleoside reverse transcriptase inhibitors combined with a ritonavir-boosted protease inhibitor).

In our series, 54.42% of patients had opportunistic infection. The most frequent were candidiasis (29.26%), tuberculosis (27.58%), cerebral toxoplasmosis (17.39%) and digestive OI (10.34%). The results are shown in Table 3.

In terms of progression, 56.3% of patients had a favorable outcome, while 43.7% died. Factors associated with death were tuberculosis (p<0.0001), toxoplasmosis (p=0.004), candidiasis (p<0.0001) and prurigo (p=0.04), as well as clinical stage 4 (p<0.0001) and CD4 ≤ 200/ml. (Table 4).

Opportunistic infections/ Illness opportunistic diseases	Headcount	Percentage (%)
Candidiasis	419	29.26
Cervical cancer	2	0.14
Neuromeningeal cryptococcosis	45	3.14
Digestive OI	148	10.34
Herpetic infection	4	0.28
Lymphoma	4	0.28
PML*	3	0.21
Kaposi's disease	49	3.42
Tuberculosis	395	27.58
Cerebral toxoplasmosis	249	17.39
Pneumocystis	2	0.14
Prurigo	98	6.84
Zona	14	0.98
Total	1432	100

Table 3: Distribution of patients by OIs and opportunistic infections

Opportunistic infections/affectations		Alive (n=697)	Deaths (n=540)	p-value
Tuberculosis	*No*	610 (87.5%)	426 (78.9%)	*p < 0.0001**
	Yes	87 (12.5%)	114 (21.1%)	
Toxoplasmosis	*No*	646 (92.7%)	475 (88%)	*0.004**
	Yes	51 (7.3%)	65 (12%)	
Candidiasis	*No*	551 (79.1 %)	373 (69.1%)	*p < 0.0001**

	Yes	146 (20.9 %)	167 (30.9%)	
*CNM	*No*	687 (98.6%)	528 (97.8%)	*0.29**
	Yes	10 (1.4%)	12 (2.2%)	
PML	*No*	696 (99.9%)	538 (99.6%)	*0.40***
	Yes	1 (0.1%)	2 (0.4%)	
Lymphoma	*No*	695 (99.7%)	538 (99.6%)	*0.58***
	Yes	2 (0.3%)	2 (0.4%)	
Kaposi	*No*	681 (97.7%)	526 (97.4%)	*0.73**
	Yes	16 (2.3%)	14 (2.6%)	
Digestive OI	*No*	686 (98.4%)	527 (97.6%)	*0.29**
	Yes	11 (1.6%)	13 (2.4%)	
Pneumocystis	*No*	696 (99.9%)	539 (99.8%)	*0.68***
	Yes	1 (0.1%)	1 (0.2%)	
Prurigo	*No*	669 (96%)	506 (93.7%)	*0.04***
	Yes	28 (4%)	34 (6.3%)	
Cervical tumor	*No*	696 (99.9%)	539 (99.8%)	*0.68***
	Yes	1 (0.1%)	1 (0.2%)	
CD4 count (/mm^3)	*≤200*	394 (79.1%)	237 (87.5%)	*0.003**
	>200	104 (20.9%)	34 (12.5%)	
WHO stage 4	*No*	433 (62.1%)	248 (45.9%)	*p < 0.0001**
	Yes	264 (37.9%)	292 (54.1%)	

***Fischer's exact test *Pearson's Chi2 *CNM: Neuromeningeal cryptococcosis*

Table 4: Distribution according to factors associated with death in bivariate analysis.

4. Discuss

The management of HIV infection and AIDS occupies an important place in the activities of the Infectious Diseases Department. The trend towards the feminization of HIV remains valid in view of our results and national statistics (EDS V) [10].

In addition to the direct action of the virus on organs, HIV destroys the immune system, making the infected individual more vulnerable to infection in the absence of early HAART. Previous authors have shown that CD4 lymphocyte count is an important predictor of the progression of HIV infection, including opportunistic infectious complications [11]. More than half of the patients on our ward had opportunistic infections. They were admitted at WHO AIDS stage (stage 3: 43.6% and stage 4: 44.9%) and 82.06% had less than 200 cells/mm3. The finding of delayed management, which we confirm here, has been reported by other authors [2, 5, 13]. The most common reasons for this were self-medication, followed using traditional therapists and, lastly, recourse to a conventional health center. Other factors have been associated, such as denial of seropositivity or even of HIV disease [2, 12]. Despite progress in access to antiretroviral treatment in Mali (HAART access initiative, HAART gratuities and check-ups, decentralization of care and delegation of tasks), most people in Mali do not know their serostatus until they are symptomatic. In Cameroon, according to Essomba et al, more than half (59.3%) of HIV-infected patients were tested following clinical suspicion [13]. Communication needs to be stepped up if the country is to meet its "90-90-90" targets.

In line with the findings of other African authors [12], tuberculosis was the second most common opportunistic infections after candidiasis, yet it was the leading cause of hospitalization in the department. Cerebral toxoplasmosis was the third most common opportunistic infections and the first IO of the central nervous system in our department. It remains the leading central nervous system OI in African series [12]. Like the findings of other authors, it generally occurred in subjects with CD4 <100/mm3 with positive serology and not receiving specific prophylaxis.

Digestive opportunistic infections were usually suspected in the presence of gastroenteritis. The most frequently isolated germs were Cryptosporidium spp and Isospora belli. Frequent shortages of reagents for the detection of digestive opportunistic germs prevented us from determining their actual prevalence during this study. In Burkina Faso, Cryptosporidium sp, followed by Blastocystis sp and Isospora belli were the main germs associated with digestive opportunistic infections [4].

As regards outcome, overall mortality was 43.7% in our series. It is comparable to that found in the infectious diseases department

by Fortes et al in Senegal (44%), but higher than the 38% of deaths in the context of a multi-center, multi-country study including our study site by Lewden et al [5, 12].

Our study confirms that tuberculosis remains the leading cause of death during AIDS. This trend is confirmed nationally and by other Africans [2, 5]. Other opportunistic infections associated with death were candidiasis ($p<0.0001$) and prurigo ($p=0.04$). Apart from opportunistic infections, death was associated with stage 4 of WHO ($p<0.0001$) and CD4 count ≤ 200/mm3, testifying to the severity of immunosuppression.

5. Conclusion

Opportunistic infections are a main cause of morbidity and mortality of HIV-infected patients in our department. They reflect the severity of immunodepression, which in turn is the result of delayed diagnosis, treatment, or therapeutic failure. Candidiasis and tuberculosis remain the most common opportunistic infections. However, mortality from tuberculosis is higher. This mortality is also high in cases of toxoplasmosis, neuromeningeal cryptococcosis and in patients admitted with Kaposi's disease. HIV screening, early treatment and opportunistic infections will help reduce mortality among of HIV-infected patients. Communication needs to be stepped up to improve screening.

References

1. Coordination Unit of the Sectoral Committee for the Fight against AIDS - Ministry of Health and Public Hygiene of Mali. (2016). Standards and protocols for the antiretroviral management of HIV and AIDS in Mali.
2. Traoré, A. M., Minta, D. K., Fomba, M., Cissé, H., Diallo, K., Coulibaly, I., ... & Bissagnené, E. (2014). Profil épidémioclinique et évolutif de patients VIH positif, référés au CHU du Point G, Bamako, Mali. Bull Soc Pathol Exot, 107(1), 22-26.
3. Minta, D. K., Dolo, A., Dembélé, M., Kaya, A. S., Sidibé, A. T., et al. (2011). Neuromeningeal cryptococcosis at the Point G. Bamako University Hospital. Mali. Med Trop, 71(6), 1- 5.
4. Sangaré, I., Bamba, S., Cissé, M., Zida, A., Bamogo, R., Sirima, C., ... & Guiguemdé, R. T. (2015). Prevalence of intestinal opportunistic parasites infections in the University hospital of Bobo-Dioulasso, Burkina Faso. Infectious diseases of poverty, 4, 1-6.
5. Fortes Déguénonvo, L., Manga, N. M., Diop, S. A., Dia Badiane, N. M., Seydi, M., Ndour, C. T., ... & Sow, P. S. (2011). Current profile of HIV-infected patients hospitalized in Dakar (Senegal). Bulletin de la Société de pathologie exotique, 104, 366-370.
6. Okome-Nkoumou, M., Boguikouma, J. B., & Kombila, M. (2006). Les maladies opportunistes de l'infection par le VIH a l'hopital Fondation Jeanne Ebori de Libreville, Gabon. *Médecine tropicale, 66*(2), 167-170.
7. Apetse, K., Assogba, K., Kevi, K., Balogou, AAK, Pitche, P., & Grunitzky, E. (2011). Opportunistic infections of the HIV/AIDS in adults in hospital settings in Togo. *Bulletin of the Society of Exotic Pathology, 104,* 352-354.
8. Health Document. (2013). Antiretroviral management policy and protocols for HIV and AIDS in Mali, 106.
9. Health Document. (2022). Norms and Protocols for Antiretroviral Management of HIV1 and AIDS in Mali, 81.
10. Planning and Statistics Unit (CPS/SSDSPF), National Institute of Statistics (INSTAT), Centre for Statistical Studies and Information (INFO-STAT). (2012-2013). Demographic and Health Survey in Mali (EDS-V).
11. ONUSIDA. (2013). Report on the Global AIDS Epidemic. Recommendations of the Expert Panel. Medical care for people living with HIV.
12. Lewden, C., Drabo, Y. J., Zannou, D. M., Maiga, M. Y., Minta, D. K., Sow, P. S., ... & IeDEA West Africa Collaboration. (2014). Disease patterns and causes of death of hospitalized HIV-positive adults in West Africa: a multicountry survey in the antiretroviral treatment era. Journal of the International AIDS Society, 17(1), 18797.
13. Essomba, N. E., Mbatchou Ngahane, B. H., Nida, M., Temfack, E., Mapoure Njankouo, Y., Abeng, R. L., ... & Coppieters, Y. (2015). Clinical and immunological profile of HIV-infected patients at the initiation of antiretroviral therapy in Douala. *Bulletin de la Société de pathologie exotique, 108*, 255-261.