

## Causes of Deaths of HIV Infected Patients at the HIV/AIDS Center of Excellence of the University of Lubumbashi in Lubumbashi, Democratic Republic of Congo

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### Abstract

Antiretroviral therapy and its major scaling up over the past decade has contributed to improving the quality of life of people living with HIV, but the mortality associated with this pandemic remains a concern in our environment and opportunistic infections are the major causes of death in most patients. The objective is to determine the causes of patients' deaths living with HIV at the Lubumbashi University Center of Excellence. A documentary review of patients was conducted from May 2011 to December 2015. Death is considered HIV-related if it is the result of an opportunistic infection in any patient with CD4 less than 200/mm<sup>3</sup>. 1717 patients were recruited to the center of excellence between May 2011 and December 2015, the mortality rate was 24.1% patient year, 67.95% women and 32.05% male 76.63% of patients had CD<sub>4</sub> less than 200 mm<sup>3</sup>. 86% of the causes were directly related to HIV, Cryptococcal neuromeningitis comes first with 16.6%, while tuberculosis follows with 15.3%; 8% of the causes were not directly related to HIV, it is notably hepatopathies with 2.6%.

**Keywords:** HIV; Mortality; Opportunistic infections

### Introduction

The fight against AIDS remains a global public health problem, among 36.9 million people living with HIV/AIDS, only 17 million are on antiretroviral therapy (ART) [1].

In our country, the Democratic Republic of Congo where the prevalence is 1.8%, the ART which was introduced 15 years ago make a significant contribution to improve the quality of life of people living with HIV/AIDS (PLHIV), but mortality remains high in our country in general and at the excellency center in particular [2].

Causes of death are dominated by opportunistic infections (OI) in powers countries and by cardiovascular diseases, viral hepatitis and cancers in the industrialized countries [3,4].

The objective of this work was to determine the causes of deaths of HIV-infected patients at the Lubumbashi University HIV/AIDS Center of Excellence.

### Methods

A documentary review of the records held at the Center of Excellence was thoroughly carried out on all files of patients who died from May 2011 to 2015. A summary was made in each file of the deceased patient, including socio-demographic, immuno-virological, the cause and circumstances of death for patients who died in hospital, and for patients who died outside the hospital, the information provided by the family, those information's was verified and classified.

The initial cause of death is defined as the disease that triggered the morbid course leading directly to death, and in all cases three doctors from the center agree on the cause of death.

The HIV Center of Excellence at the University of Lubumbashi currently has 4312 patients. It is the largest center in RD. Congo, quality of care, researches are required and a team of 25 researchers work there every day.

Patient characteristics were compared by cause of death using the CHI<sup>2</sup> test, based on the distribution of characteristics.

### Results

#### General characteristics

We followed 1717 patients at the Excellency Center between 2011 and 2015, and the total number of deaths was 415, 24.1%, including 282 women (67.95%) and 133 men (32.05%). 51.08% of deceased patients were between 20 and 29 years old age and 74.94% were married; the commune of Kampemba had the largest number of deaths, 33.01%; 76.63% of the patients who died had CD<sub>4</sub> <200/mm<sup>3</sup>.

#### Causes of death

86.0% of the causes of death were directly related to HIV versus 11.9% of non-HIV causes and 3% of unknown causes; 318 patients died (76.63%) had CD<sub>4</sub> <200/mm<sup>3</sup>; neuro-meningeal cryptococcosis is at the top of the list of HIV-related causes with 16.6%, while tuberculosis and toxoplasmosis follow with 15.3% and 2.6%, respectively. Immune reconstitution has taken about 1.7% of our patients. HIV-related cancers occupy 3% of the causes of death, with Kaposi disease (1.7%). In non-HIV-related causes, liver disease accounts for the largest share, at 2.6%.

## Discussion

The annual mortality related to HIV has decreased significantly worldwide, from 6.4% between 2000 and 2003 to 2.3% in 2014, it varies from country to country, in North America, Australia and Europe, mortality is 1.27% patient per year, Brazil 3.2%, South Korea 5.19%, Tunisia 5.4% patient per year; our study showed a mortality rate of 24.1% at the Lubumbashi University Center [5-8].

Late initiation to antiretroviral therapy (ART) is the basis of the high mortality rate, in fact 76.6% of patients died with  $CD_4 \leq 200/mm^3$  in a country where initiative 90-90-90 are struggling to find their way, very few people know is HIV status, they discover it at the stage of illness, and generally with a low  $CD_4$  account, voluntary screening, counseling have not yielded the expected results over the past 10 years, with 95% of patients recruited to the Center of Excellence presenting with a major opportunistic infection (OI), and all of them died shortly after ART (Table 1).

$CD_4 < 200/mm^3$	Frequency	Percent
OUI	318	76.63%
NON	97	23.37%
Total	415	100.00%

**Table 1:** Breakdown by  $CD_4$  count.

67.95% of the deaths patients are women; the woman is the weakest link in the care, since not only is victimized, but also does not have sufficient financial resources to seek treatment; in a highly masculine society like ours, men have the time to start HAART, 2 to 5 years before their wives, which means that they usually come to the disease stage with major OI and little financial means (Table 2).

Sex	Frequency	Percent
Female	282	67.95%
Male	133	32.05%
Total	415	100.00%

**Table 2:** Distribution by sex.

71.32% of the deaths patients are in the age group of 20 to 39 years, unfortunately it is the youth working-class which is the very pillar of the development of our country; generally stigmatized, and without financial means, this youth is hidden in the churches, and the small centers of health in the city, when they are referred to us it is generally at an outdated stage (Table 3).

Age	Frequency	Percent
$\leq 19$	9	2.17%
20 – 29	212	51.08%
30 – 39	84	20.24%
40 – 49	73	17.59%

50 – 59	32	7.71%
$\geq 60$	5	1.20%
Total	415	100.00%

**Table 3:** Distribution by age.

Difficulties in care continue to persist, although government partners support all HIV-related activities, so OI remain the orphaned children in the fight against HIV in our environment.

The neuromeningeal cryptococcosis which constitutes in our environment the first cause of death of people living with HIV (PLHIV), this OI is poorly managed because of the lack of adequate antifungals but also and most importantly it is the diagnostic reason for HIV infection mainly in patients with  $CD_4 \leq 200/mm^3$  who come to the center of excellence. Moreover, the high cost of fluconazole, amphotericine B, and the inexistence in the market of flucitosine are also the basis of this poor clinical management.

Still in HIV-related causes, tuberculosis mainly pulmonary tuberculosis and secondarily neuromeningeal is the second leading cause of death of PLHIV at the center of excellence. 15.3%; the INH prophylaxis was introduced very late in the management of TB.

Toxoplasmoses still a big problem because of the late diagnosis and the high cost of treatment 2.6%.

HIV-related cancers such as Kaposi's disease and cervical cancers are at the bottom of the 0.9% HIV-related to mortality chart, the diagnostic difficulties and the cost of treatment are at the root.

In the industrialized countries, the most common causes of HIV-related mortality are liver diseases and cardiovascular diseases [3-10]. We find a low rate of liver diseases (2.6%) in our center (Tables 4-6).

In poor countries, tuberculosis and cryptococcosis are frequently associated with high HIV-related mortality [4-7]. In Tunisia, the causes presented are pulmonary pneumocystosis followed by neuro-meningeal cryptococcosis and toxoplasmosis [8]. As you will have noticed in our community the management of OI, the late diagnosis, lead to a number of the problems that are the basis of a high mortality, in the poor countries, almost all patients die of an HIV-related cause.

We will not overcome the problem of therapeutic adherence and its impact on the high death rate; this explains the increase of OI during treatment, the therapeutic failures with direct consequence a high mortality.

The nutritional problem directly related to the economic and social conditions in our country was also noted, the treatment package that did not integrate the nutritional component constitutes a handicap of therapeutic adherence.

The low rate of education correlated with our socio-economic conditions will not be left behind.

In the end, we have an increasing influence of religious believe that push our patients to abandon the treatment for prayer, hoping for a miracle cure healing [11,12].

Cause of death	Morocco (n=1243) 1999-2009	Korea (n=327) 1998-2006	Brazil (n=1538) 1997-2006	Europe, North, Am.au Australia (n=49731) 1999-2011	France (n=82000) 2010	Tunisia (n=213) 2000-2014	Our study (n=1717) 2011-2015
<b>HIV-related</b>	96	55.9	49.1	29	25	70.4	46.4
OI	85	50	37.6	-	-	44.4	39.6
Tuberculosis	35	22.1	-	-	4	3.7	15.3
Pneumocystis	0	10.3	-	-	-	11.1	1.3
Toxoplasmosis	9	0	-	-	-	5.6	2.6
Cryptococcosis	13	1.5	-	-	-	11.1	16.6
Cryptosporidiosis	19	0	-	-	-	1.8	1.7
Atypical Mycob	2	0	-	-	-	0	0.4
Cachectique syndrome	1	10.3	-	-	-	0	0
SIRI	6	0	-	-	-	0	1.7
CMV infection	0	1.5	-	-	-	3.7	0
LEMP	0	1.5	-	-	3	3.7	0
HIV encephalitis	0	3	-	-	-	3.7	0
<b>Cancers</b>	11	5.9	7.5	-	9.3	9.2	3
NH lymphoma	4	5.9	-	-	7.3	7.4	0.4
Kaposi syndrome	6	0	-	-	1.5	1.8	1.7
Cervical cancer	1	0	-	-	0.5	0	0.9
Indefinite	0	4.4	4	-	-	16.7	3.8
<b>Non-HIV related</b>	4	36.8	43.4	64	67	14.8	8.1
Aspergillosis	1	0	-	-	-	0	0
Liver disease	2	7.4	3.5	13	11	1.8	2.6
Cancers	1	4.4	3.5	15	27	1.8	0
Infection bacterial	0	5.9	8.4	7	-	7.4	0.9
MCV	0	7.4	4	11	9	0	0
Gastrointestinal disease	0	2.9	-	-	10	0	1.7
Accident	0	1.5	-	2	-	0	0.4
Suicide	0	7.4	-	4	-	0	0
Homicide	0	0	-	1	5	0	0
Overdose	0	0	-	3	-	0	0
Renal insufficiency	0	0	-	1	-	0	1.7
Pancreatitis	0	0	0	0	-	0	0
Other	0	0	23.9	6	5	3.7	0.9
Unknown	0	2.9	7.5	7	8	14.8	3

Total deaths	91	68	226	3909	728	54	415
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**Table 4:** Comparative table of causes of death.

Origin	Frequency	Percent
Kampemba	137	33.01
Annex	75	18.07
Lubumbashi	66	15.9
Katuba	53	12.77
Ruashi	31	7.47
Likasi	12	2.89
Katuba	11	2.65
Kenya	9	2.17
Kamalondo	12	2.89
Kolwezi	6	1.45
Kasumbalesa	3	0.72
Total	415	100

**Table 5:** Origin of deceased patients.

Civil status	Frequency	Percent
Married	331	74,94
Single	23	5,54
Widow	11	2,65
Divorce	70	16,87
Total	415	100,00

**Table 6:** Civil status of deceased patients.

## Contributions of the Study

- In the center of excellence, HIV related mortality remains high (24.1%) in the area of antiretroviral therapy.
- Neuromeningeal cryptococcosis and pulmonary tuberculosis are the leading causes of HIV-related deaths.
- The women constitute 67.95% of deaths at the Center of Excellence.

## Conclusion

Our study has shown that HIV infected patients die in our environment because of late diagnosis, late treatment of opportunistic infections and the high costs of hospitalization.

Diagnostic capacity building, massive voluntary screening, correct management of OI and early initiation to ART should be considered to reduce this HIV related mortality.

## Conflicts of Interest

The authors state that there is no conflict of interest.

## Contribution of Authors

All authors have contributed to the conduct of this work, read and approved.

## References

1. No authors listed (2016) Guide de prise en charge intégrée du VIH en RD Congo, PNLS.
2. (2016) Nouvelles recommandations de l'OMS.
3. Gill J, May M, Lewden C, Saag M, Mugavero M, et al. (2010) Causes of death in HIV-1-infected patients treated with antiretroviral therapy, 1996-2007: collaborative analysis of 13 HIV cohort studies. Clin Infect Dis 50: 1387-1396.
4. Sodqi M, Marih L, Lahsen AO, Benghir R, Chakib A, et al. (2012) Causes of death among 91 HIV-infected adults in the era of potent antiretroviral therapy. Press Med 41: E386-390.
5. Pacheco AG, Tuboi SH, Moreira LE, Ramadas L, Nunes EP, et al. (2009) Temporal changes in causes of death among HIV-infected patients in the HAART era in Rio de Janeiro, Brazil. J Acquir Immune Defic Syndr 51: 624-630.
6. Smith CJ, Ryom L, Weber R, Morlat P, Pradier C, et al. (2014) Trends in underlying causes of death in people with HIV from 1999 to 2011 (D:A:D) a multicohort collaboration. Lancet 384: 241-248.
7. Lee SH, Kim, Lee SG, Cho H, Chen DH, et al. (2013) Causes of death and risk factors of mortality among HIV-infected patients receiving antiretroviral therapy in Korea. J Korean Med Sci 28: 990-997.
8. Chelli J, Bellazreg F, Aouem A, Hattab Z, Mesmia H, et al. (2016) Causes of death of HIV-infected patients in the Tunisian Center. Pan Afr Med J 25: 105.
9. Bonnet F, Morlat P, Chêne G, Mercié P, Neau D, et al. (2002) Causes of death among HIV-infected patients in the era of highly active antiretroviral therapy, Bordeaux, France, 1998-1999. HIV Med 3: 195-199.
10. Morlat P, Roussillon C, Rosenthal E, Mortier E, Bergmanne JF, et al. (2012) Evolution des causes de décès chez les patients infectés par le VIH entre 2000 et 2010 ; résultats de l'enquête nationale Mortalité 2010 (ANRS EN 20). Rev Med intern 33: S28.
11. Vandenhende MA, Roussillon C, Henard S, Morlat P, Okasenhendier E, et al. (2015) Cancer-related causes of death among HIV-infected patients in France 2010 : Evolution since 2000. PLOS One 10: e0129550.
12. Helleberg M, May MT, Ingle SM, Dabis F, Reiss P, et al. (2015) Smoking and life expectancy among HIV-infected individuals on antitroviral therapy in Europe and North America. AIDS 29: 221-229.