Full Length Research Paper

Predictive factors of loss to follow-up and mortality in HIV-infected patients after initiation of antiretroviral therapy at district hospital of Boromo, Burkina Faso

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Loss to follow-up (LTFU) and mortality after initiating antiretroviral therapy (ART) remain major problem. We described predictive factors of LTFU and mortality after initiating ART among people living with HIV (PLHIV) and were followed in the district hospital of Boromo. This was a retrospective cohort study design of PLHIV enrolled for care and treatment in the district hospital of Boromo between 1 January 2015 and 31 December 2019. Eligibility was based on being 15 years and above. A competing risk analysis was used to identify LTFU and mortality predictive factors. Five hundred and fifty (550) PLHIV were included in this study. They were female in the majority (80.55%) and had a median age of 34 years [interquartile range (IQR): 26-43]. The median follow-up time was 1.28 years (IQR: 0.47-2.87). The incidence rate of LTFU was 220 (95% CI: 191.8-252.4) per 1000 person-years (PY). The predictive factors of LTFU were young age (age<45 years) [adjusted sub-hazard ratio (aSHR)=1.79; 95% CI: 1.19-2.68; *p=0.0011*] and HIV2 infection (aSHR =2.15; 95% CI: 1.26-3.67; *p=0.0011*). The mortality incidence rate was 34.5 (95% CI: 24.4-48.8) per 1000 person-years. The predictors of mortality were advanced disease stage based on WHO classification (aSHR=2.76; 95% CI: 1.25-6.09; *p=0.0115*) and lack of cotrimoxazole prophylaxis (aSHR=2.65; 95% CI: 1.17-5.97; *p=0.0185*). The incidence rates of LTFU and mortality after initiating ART were high. Strengthening therapeutic education and outreach by community health workers focusing PLHIV who are more at risk would lead to better ART outcomes.

Key words: HIV, antiretroviral therapy, loss to follow-up, mortality, Boromo, Burkina Faso.

INTRODUCTION

Human immunodeficiency virus (HIV) infection has been a major public health problem for four decades. In 2020,

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37.7 millions [30.2 million-45.1 million] people lived with HIV (PLHIV). Of these, more than two-thirds lived in sub-Saharan Africa (SSA) (Fiche d'information, 2020).

Access to antiretroviral therapy (ART) among PLHIV in SSA has increased over the years (Fiche d'information, 2020). Despite increased availability of ART and promising efficacy reported from ART programs in Africa, mortality has been high particularly the first few months after initiating ART (Birhanu et al., 2021; Damtew et al., 2015).

In Burkina Faso, the prevalence of HIV infection fell from 1.3 to 0.8% between 2014 and 2017 among adults aged 15-49 years and ART coverage rose from 60.4 to 69% between 2013, and the end of 2016. In addition, the decentralisation of HIV care has enabled the establishment of care and support sites in semi-urban and even rural areas, depending on the health pyramid (Focus, 2020).

Since the introduction of ART, several studies worldwide have documented the incidence and predictive factors of loss to follow-up (LTFU) and mortality after ART initiation (Aung et al, 2018; Odafe et al., 2012; Blevins et al., 2015; Tran and Ngo, 2013). In Burkina Faso, previous studies, often conducted as part of research projects or one-off evaluations, have documented high attrition (LTFU and mortality) rates in PLHIV cohorts (Kouanda et al., 2012). However, few studies have assessed the ART outcome in the routine management of PLHIV after ART initiation in semi-urban settings.

A better understanding of predictive factors of LTFU and mortality could help design interventions to reduce mortality and LTFU in patients who initiate ART. This study was aimed to assess the incidence and predictors of LTFU and mortality after ART initiation among the PLHIV cohort of the Boromo, Burkina Faso district hospital.

MATERIALS AND METHODS

Study site

The study was performed in the district hospital of Boromo. This hospital is the referral center for the first-level health facilities of the district. Boromo is a semi-urban crossroads town. Several artisanal gold panning sites are scattered throughout the villages of Boromo and the neighbouring rural municipalities, attracting a significant flow of people. In these sites, certain risky behaviours develop, such as drug use and prostitution, with risks of transmission of sexually transmitted infections, including HIV.

Study design, population and sample

This was a retrospective cohort study design. For this study, we selected HIV-infected patients (≥ 15 years) who initiated ART between 1 January 2015 and 31 December 2019. The analysis did not include patients who received ART for post-exposure prophylaxis to body fluids. Patients for whom the dates of ART initiation were not known were also excluded. The sampling was exhaustive.

Definitions

Patient follow-up began at the date of ART initiation and was censored at the earliest of death, transfer out, last clinic visit, or analysis closure.

Loss to follow-up: A patient was classified as a loss to follow-up if he/she had no contact for at least 90 days (three months) after the last missed appointment and was not recorded as a transfer or death (Organisation mondiale de la Santé 2018).

Death: This was any death of an HIV-infected patient taking ART. Deaths were recorded in medical records (physical or electronic) (Organisation mondiale de la Santé 2018).

Data collection and management

Data from the ESOPE database (Evaluation et Suivi Opérationnel des Programmes d'Esther), WAS used, a software used for the medical follow-up of PLHIV.

Information on socio-demographic characteristics: age, sex, professional activity, marital status, number of children, educational level, the distance between the place of residence and the district hospital were collected; clinical characteristics: body mass index (BMI), Karnofsky index, WHO clinical stage, ART regimen used, cotrimoxazole prophylaxis, ART outcome (still followed, transferred, dead, loss to follow-up) and biological characteristics: HIV type, CD4 count, hemoglobin. Death and LTFU were considered dependent variables.

Missing data in the ESOPE database were collected from physical registers (medical, laboratory, and pharmacy records).

The data collected in the physical registers were completed in the ESOPE database to improve quality.

The data were collected by the investigator. All completed data collection forms were examined for completeness, consistency and clarity during data management.

Statistical analysis

Data exploration was carried out to check for any inconsistencies, coding error, out of range, and appropriate corrections were made.

Statistical analysis was performed using Stata Statistical Software version 15.0 (Stata Corporation College Station, Texas 77845 USA). Continuous quantitative variables were presented as medians with interquartile ranges (IQRs). The discretized quantitative and qualitative variables were presented as proportions.

Mortality and LTFU rates were calculated by summing the number of patients who experienced the event (death, or LTFU) during a particular time divided by the total number of years of follow-up during this period.

The Kaplan-Meier method was used to plot the cumulative incidence of mortality and LTFU.

Predictive factors of death and LTFU were investigated using Fine and Gray's competitive hazard models (Putter et al., 2007). The results were expressed as Sub-Hazard Ratios (SHR) with 95% confidence intervals (CI) and p-values associated with each factor.

In univariate analysis, we individually tested the association between the clinical, biological, and socio-demographic characteristics and mortality or LTFU. Variables with a p-value ≤ 0.20 were retained for multivariate analysis.

In multivariate analysis, the top-down "stepwise" selection method was used for model reduction. It consisted of progressively removing from the model the variables with the highest degree of significance (p-value) until the final model was obtained, where the variables all have a significant p-value (p ≤ 0.05). For all statistical analyses, the significance level was set at 0.05.

Ethics statement

We requested and obtained permission for data collection from the District Medical Officer of Boromo. Given the sensitive nature of HIV data, we anonymised the data and use identification numbers. The confidentiality of the data was respected.

RESULTS

Patient outcome

A total of 550 patients were included in this study. Two hundred and four (37.09%) of the included patients had been lost to follow-up, 32 (5.81%) had died, and 22 (4%) had been transferred to another HIV center. On the point date, 292 (53.10) 292 were still being followed (Figure 1). The median follow-up time was 1.28 years (IQR: 0.47-2.87).

Characteristics of the patients

The vast majority of patients were female (80.55%). Their median age was 34 years (IIQ:26-43). Eighty-three percent of the patients had no education level; eighty-two percent resided within a radius of more than 5 km from the district hospital. Most (92.88%) of the patients were infected with HIV1. About one-third of the patients (33.6%) were classified as WHO clinical stage III or IV. The median CD4 count was 217 cells/mm³ (IIQ: 101-391). Sixty-three percent of patients were taking cotrimoxazole prevention in addition to ART. A large majority (88.4%) were on an ART regimen of two nucleosides reverse transcriptase inhibitors (NRTIs) and one non-nucleoside reverse transcriptase inhibitor (NNRTI). Details of the characteristics of patients are presented in Table 1.

Incidences and predictive factors of LTFU and mortality

The incidence rate of LTFU after ART initiation was 220 (95% CI: 191.8-252.4) per 1000 person-years (PY). The mortality rate after ART initiation was 34.5 (95% CI: 24.4-48.8) per 1000 PY. The cumulative incidence curves of LTFU and mortality are presented in Figure 2.

In the multivariate analysis, age between 15 and 44 at ART initiation [Adjusted Sub-Hazard Ratio (aHSR)=1.79; 95% CI:1.19-2.68; p=0.0011] and HIV2 infection (aHSR=2.22; 95% CI:1.38-3.72; p=0.0011) were the independent significant predictors of LTFU.

The distance between the residence and the district hospital was not associated with LTFU. Predictors of LTFU are presented in Table 2.

WHO clinical stage III or IV (SHRa=2.76; 95% CI:1.25-6.09; p=0.0115) and lack of cotrimoxazole prophylaxis (SHRa=2.65; 95% CI:1.17-5.97; p= 0.0185) were the independent, significant predictors of mortality after ART initiation. Predictors of mortality are presented in Table 3.

DISCUSSION

This study reports a 5-year follow-up of a cohort of 550 HIV-infected patients who attended the district hospital of Boromo between 1 January 2015 and 31 December 2019.

We showed that the incidence rate of LTFU was high: 220 (95% CI: 191.8-252.4) per 1000 P-Y. The cumulative incidence curve showed that LTFU increased quickly during the first year of treatment (Figure 2). This high incidence rate could be explained by a lack of understanding that ART is lifelong, stigma, social problems, financial problems, and adverse effects of ART (ONUSIDA, 2014; Wolff et al., 2017). Moreover, this result suggests that many of these LTFU patients are, in fact, unreported deaths. Studies elsewhere have found, after an active search, that two-thirds (2/3) of LTFU were deaths (Wolff et al., 2017; Bekolo et al. 2013). LTFU is a source of ART discontinuation, treatment failure, and acquired resistance to ART (Bernède, 2011). Strategies have been developed for tracing LTFU. However, insufficient financial resources, lack of telephone contacts, or non-functional telephone numbers limit the effectiveness of these interventions. In the context of limited resources, the focus should be on strengthening therapeutic education and outreach by community health workers. A study from Guinea-Bissau found a rate of LTFU of 24.9 (95% CI 23.4-26.5) per 100 PY, which is close to the present study (Hønge et al., 2013). Other researchers from Ethiopia have reported lower incidence rates of LTFU rates than ours (Tiruneh et al., 2020; Mekonnen et al., 2019).

Two (2) baseline predictors of LTFU were identified, which were age between 15 and 44 at ART initiation (SHRa=1.79; 95% CI [1.19-2.68]) and HIV2 infection (SHRa =2.15; 95% CI [1.26-3.67]). Indeed, patients aged 15-44 years had a higher risk of being LTFU than older patients (age ≥45 years). The instability of young people could explain this due to moving to other localities in search of work. In addition, the province is full of artisanal gold sites, which suggest that some patients were temporarily resident in the locality and moved elsewhere without informing the district hospital (District Sanitaire De Boromo, 2018).. This age group also contains the category of adolescents patients. Our results could also be explained by the fact that teenage years are accompanied by many changes, such as increased risk behaviours, separation from parental involvement, psychiatric problems, fear of stigmatization, and lack of social support, which are determinants of low retention in this category of patients (Hønge et al., 2013). Our result is comparable to other studies in low-income settings
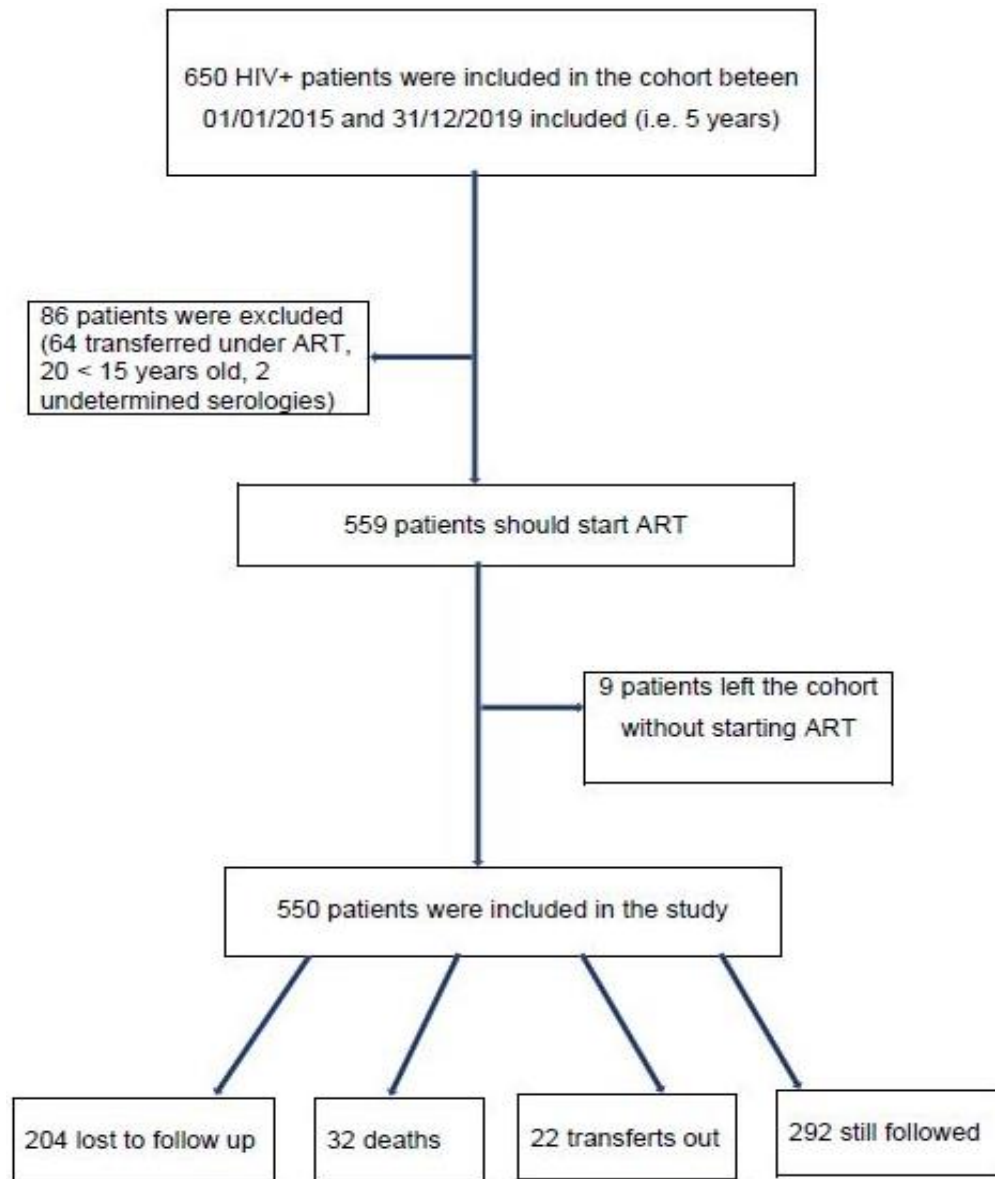
Figure 1. Flow chart of HIV-infected patients who have attended the district hospital of Boromo between 1 January 2015 and 31 December 2019. ART: Antiretroviral therapy.
Source: Yaméogo et al. (2023).

(Tran et al., 2013). Also, patients infected with HIV2 were at higher risk of LTFU during follow-up than those infected with HIV1 or HIV1&2. This finding is shared by other authors (Hønge et al., 2013; Tiruneh et al., 2020; Mekonnen et al., 2019; District Sanitaire De Boromo, 2018; Bognounou et al., 2015). This result could be explained by the good clinical condition of these patients, which makes them wrongly believe that they are not ill. Indeed, the clinical latency period of HIV2 infection is more extended, and its progression to opportunistic infections is generally lower than for HIV1 (Marlink et al., 1994). A more cumbersome treatment regimen could also explain it. Indeed, there was no single-dose regimen

for HIV2 infection. The distance between the patient's residence and the district hospital did not predict LTFU. The results of the present study are not corroborated by other studies that found that patients who lived more than 5 km from the district hospital had a higher risk of being lost to follow-up (Tiruneh et al., 2020; Baldé et al., 2019). This could also be explained by the fact that patients prefer health centers further away from their homes in order to keep their status confidential and avoid stigmatisation. A qualitative study could further support this finding.

The study found a mortality of 34.5 (95% CI: 24.4-48.8) per 1000 PY. The cumulative incidence curve showed

Table 1. Baseline characteristics according follow-up outcome of HIV-infected patients who have attended the district hospital of Boromo between 1 January 2015 and 31 December 2019.

Characteristics	Outcome of the follow-up			Total N=550 n (%)
	Under care/Transferred out	Died	LTFU	
	n=314 (57.09%)	n=32 (5.82%)	n=204 (37.09%)	
	n (%)	n (%)	n (%)	
Age (years) *(n=550)*	35 (28-44)	42.5 (34-52.5)	32 (25-40)	34 (26-43)
[15-45[	241 (76.75)	18 (56.25)	174 (85.29)	433 (78.73)
≥ 45	73 (23.25)	14 (43.75)	30 (14.71)	117 (21.27)
Sex *(n=550)*				
Male	56 (17.83)	11 (34.38)	40 (19.61)	107 (19.45)
Female	258 (82.17)	21 (65.63)	164 (80.39)	443 (80.55)
Professional activity *(n=544)*				
Unpaid	253 (81.35)	20 (66.67)	162 (79.80)	435 (79.96)
Paid	58 (18.65)	10 (33.33)	41 (20.20)	109 (20.04)
Marital status *(n=536)*				
Single	27 (8.82)	2 (6.90)	25 (12.44)	54 (10.07)
In couple	223 (72.88)	19 (65.52)	155 (77.11)	397 (74.07)
Divorced/Widowed	56 (18.30)	8 (27.59)	21 (10.45)	85 (15.86)
Number of children *(n=530)*				
0	48 (15.74)	3 (9.38)	45 (23.32)	96 (18.11)
1-2	103 (33.77)	10 (31.25)	70 (36.27)	183 (34.53)
≥3	154 (50.49)	19 (59.38)	78 (40.41)	251 (47.36)
Education level *(n=528)*				
None	245 (81.94)	30 (93.75)	164 (83.25)	439 (83.14)
Educated	54 (18.06)	2 (6.25)	33 (16.75)	89 (16.86)
Place of residence *(n=550)*				
≤ 5 km	56 (17.83)	8 (25.00)	35 (17.16)	99 (18.00)
> 5 km	258 (82.17)	24 (75.00)	169 (82.84)	451 (82.00)
WHO clinical stage *(n=548)*				
Stage I/II	214 (68.15)	11 (35.48)	139 (68.47)	364 (66.42)
Stage III/IV	100 (31.85)	20 (64.52)	64 (31.53)	184 (33.58)
BMI (kg/m²) *(n=268)*				
<18.5	49 (27.22)	8 (57.14)	21 (28.38)	78 (29.10)
≥18.5	131 (72.18)	6 (42.86)	53 (71.62)	190 (70.90)
Karnofsky index *(n=549)*				
Normal activity	103 (32.80)	8 (25.81)	74 (36.27)	185 (33.70)
Bedridden less than 50%	150 (47.77)	11 (35.48)	82 (40.20)	243 (44.26)
Bedridden for more than 50%	61 (19.43)	12 (38.71)	48 (23.53)	121 (22.04)
ART Regimen used *(n=550)*				
2 NRTI + 1 NNRTI	282 (89.81)	29 (90.63)	175 (85.75)	486 (88.36)
2 NRTI + 1 PI	32 (10.19)	3 (9.38)	29 (14.22)	64 (11.64)

Table 1. Cont'd

Cotrimoxazole prophylaxis *(n=549)*				
Yes	197 (62.74)	10 (32.26)	139 (68.14)	346 (63.02)
No	117 (37.26)	21 (67.74)	65 (31.86)	203 (36.98)
HIV type *(n=550)*				
HIV1	297 (94.59)	29 (90.63)	183 (89.71)	509 (92.55)
HIV2	8 (2.55)	2 (6.25)	12 (5.88)	22 (4.00)
HIV1&2	9 (2.87)	1 (3.13)	9 (4.41)	19 (3.45)
CD4 count (cells/µl) *(n=279)*				
<200	81 (45.25)	17 (73.91)	40 (51.95)	138 (49.46)
≥200	98 (54.75)	6 (26.09)	37 (48.05)	141 (50.54)
Hemoglobin (g/dl) *(n=260)*				
<11	77 (45.56)	19 (86.36)	46 (66.67)	142 (54.62)
≥11	92 (54.44)	3 (13.64)	23 (33.33)	118 (45.38

WHO, World Health Organization; BMI, body mass index; ART, antiretroviral therapy; LTFU, loss to follow-up; HIV, human immunodeficiency virus; NRTI, nucleoside reverse transcriptase inhibitors; NNRTI, non-nucleoside reverse transcriptase inhibitor; PI, protease inhibitor. LTFU, loss to follow-up.
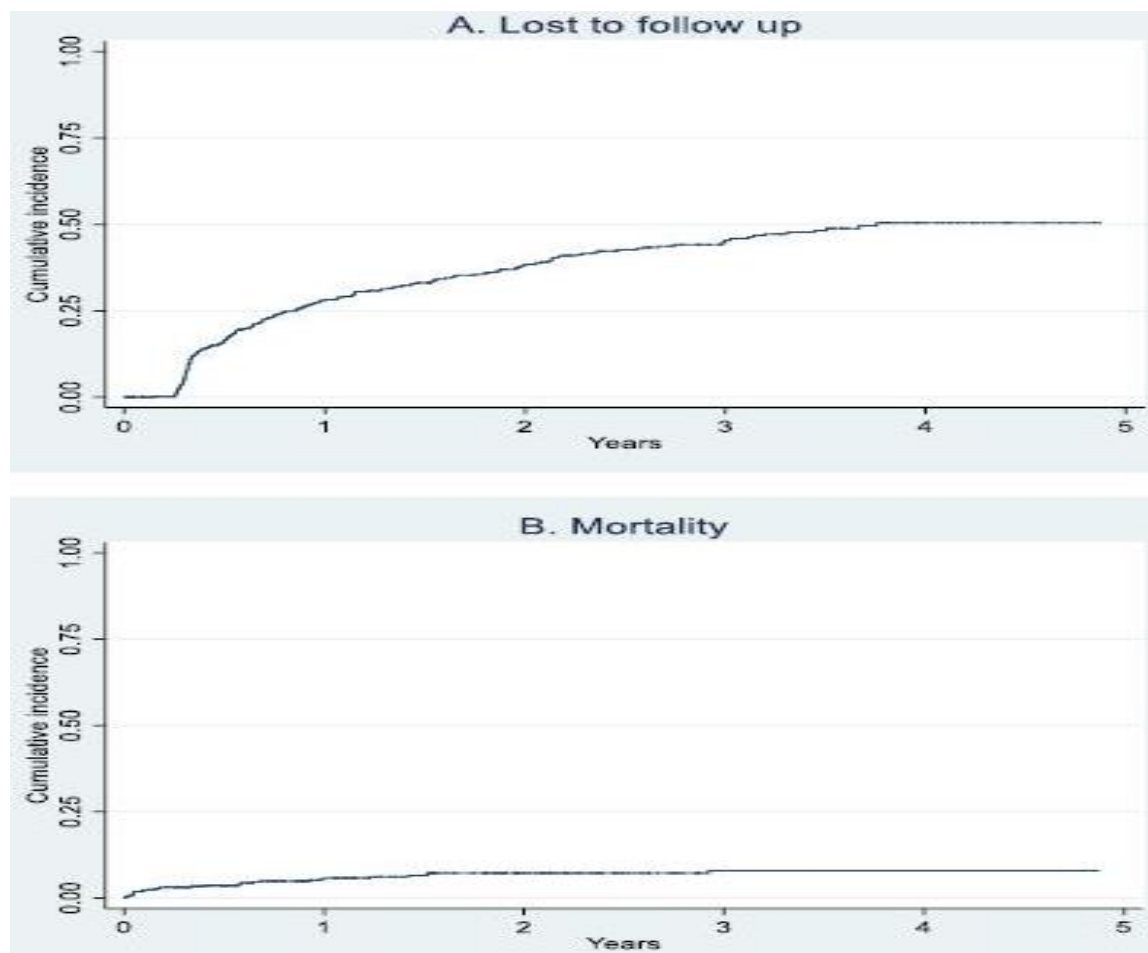Source: Yaméogo et al. (2023).

Figure 2. Cumulative incidence of loss to follow-up (A) and cumulative incidence of mortality (B).
Source: Yaméogo et al. (2023).

Table 2. Predictive factors of loss to follow-up after ART initiation among HIV-infected patients who have attended the district hospital of Boromo between 1 January 2015 and 31 December 2019.

Characteristics	Univariate analysis		Multivariate analysis	
	SHR (IC 95%)	P-value	SHRa (IC 95%)	P-value
Age (years)		0.0109		0.0011
≥ 45	1		1	
[15-45[	1.67 (1.12-2.48)		1.79 (1.19-2.68)	
Sex		0.9118		
Male	1			
Female	0.97 (0.68-1.40)			
Professional activity		0.9811		
Unpaid	1			
Paid	0.99 (0.69-1.42)			
Marital status		0.0057		
Single	1			
In couple	0.84 (0.55-1.28)			
Divorced/Widowed	0.41 (0.23-0.74)			
Number of children		0.0265		
0	1			
1-2	0.82 (0.56-1.19)			
≥3	0.61 (0.42-0.88)			
Education level		0.7754		
None	1			
Educated	0.94 (0.65-1.36)			
Place of residence		0.8670		
≤ 5 km	1			
> 5 km	1.03 (0.71-1.49)			
WHO clinical stage		0.3829		
Stage I/II	1			
Stage III/IV	0.84 (0.60-1.16)			
BMI (kg/m²)		0.9426		
≥18.5	1			
<18.5	1.01 (0.61-1.68)			
Karnofsky index		0.5715		
Normal activity	1			
Bedridden less than 50%	0.95 (0.69-1.29)			
Bedridden for more than 50%	1.15 (0.80-1.67)			
ART Regimen used		0.1254		
2 NRTI + 1 NNRTI	1			
2 NRTI + 1 PI	1.36 (0.91- 2.03)			
Cotrimoxazole prophylaxis		0.0539		
Yes	1			

Table 2. Cont'd

No	0.74 (0.55- 1.00)			
HIV type		0.0392		0.0011
HIV1/HIV1&2	1		1	
HIV2	1.79 (1.02-3.13)		2.15 (1.26-3.67)	
CD4 count (cells/µl)		0.3561		
≥200	1			
<200	1.23 (0.78- 1.93)			
Hemoglobin (g/dl)		0.0254		
≥11	1			
<11	1.76 (1.07- 2.89)			

SHR, Sub hazard ratio; SHRa, adjusted sub hazard ratio; 95% CI, 95% confidence interval.
Source: Yaméogo et al. (2023).

Table 3. Predictive factors of mortality after ART initiation among HIV-infected patients who have attended the district hospital of Boromo between 1 January 2015 and 31 December 2019.

Variable	Univariate analysis		Multivariate analysis	
	SHR (IC 95%)	P-value	SHRa (IC 95%)	P-value
Age (years)		0.0042		
[15-30[	1			
[30-45[	2.36 (0.77-7.16)			
≥45	5.52 (1.82-16.70)			
Sex		0.0357		
Male	1			
Female	0.45 (0.22- 0.94)			
Professional activity		0.0761		
Unpaid	1			
Paid	1.99 (0.93-4.26)			
Marital status		0.2562		
Single	1			
In couple	1.32 (0.30- 5.75)			
Divorced/Widowed	2.50 (0.53-11.82)			
Number of children	1	0.2782		
0	1			
1-2	1.88 (0.52- 6.77)			
≥3	2.56 (0.76-8.55)			
Education level		0.1202		
None	1			
Educated	0.31 (0.07-1.34)			
Place of residence		0.2683		
≤ 5 km	1			
>5 km	0.63 (0.28-1.14)			

Table 3. Cont'd

WHO clinical stage		0.0004		0.0115
Stage I/II	1		1	
Stage III/IV	2.94 (1.31-6.55)		2.76 (1.25-6.09)	
BMI (kg/m²)		0.0223		
≥18.5	1			
<18.5	3.40 (1.19-9.73)			
Karnofsky index		0.0623		
Normal activity	1			
Bedridden less than 50%	1.10 (0.44-2.72)			
Bedridden for more than 50%	2.52 (1.03-6.12)			
ART Regimen used		0.6588		
2 NRTI + 1 NNRTI	1			
2 NRTI + 1 PI	0.76 (0.23-2.50)			
Cotrimoxazole prophylaxis		0.0007		0.0185
Yes	1		1	
No	3.65 (1.71-7.75)		2.65 (1.17-5.97)	
HIV type		0.5142		
HIV1/HIV1&2	1			
HIV2	0.62 (0.15-2.57)			
CD4 count (cells/µl)		0.0133		
≥200	1			
<200	3.17 (1.27-7.92)			
Hemoglobin (g/dl)		0.0064		
≥11	1			
<11	5.45 (1.61-18.43)			

Source: Yaméogo et al. (2023).

that mortality increased quickly during the first year of treatment (Figure 2).

This high mortality could be explained by late consultation and ART initiation. Similar results have been reported in the literature (Bernède, 2011; Teshale et al.2021). However, a African study conducted in Kenya, Uganda, Tanzania, and Nigeria have reported lower mortality rate of 11.42 deaths per 1000 person-years (95% CI: 9.53–13.68) (Kibuuka et al., 2022). Our study nevertheless showed a decrease in mortality compared to the effects of a study conducted in Burkina Faso who noted a mortality rate of 60 per 1000 PY (Kouanda et al., 2012). This decrease in mortality could be partly due to universal access to ART (OMS, 2020).

Patients in WHO clinical stage III or IV at ART initiation were almost three times more likely to die during follow-up than those in the WHO clinical stage I or II. This is supported by other studies conducted in other African countries (Teshale et al., 2021; Schepens et al., 2010). The importance of the WHO clinical stage as a prognostic factor for death in PLHIV starting ART is well established (Grimsrud et al. 2014; Fox et al., 2015). Furthermore, our results could be explained by the high frequency of opportunistic diseases in these patients. Indeed, at an advanced WHO clinical stage, opportunistic infections such as tuberculosis, cerebral toxoplasmosis, oesophageal candidiasis, pneumocystis, and neuro-meningeal cryptococcosis are life-threatening, especially in developing countries (Bognounou et al. 2015 and Ministère de la santé Burkina Faso 2018).

Patients who were not on cotrimoxazole prophylaxis were almost three times more likely to die during follow-up. Results from systematic reviews and have shown that co-trimoxazole significantly increases the survival of HIV-

infected patients (Roura et al. 2009; OMS, 2017; Walker et al., 2010; De Sousa Moreira, 2015). Co-trimoxazole prophylaxis is a strategy to use cotrimoxazole in PLHIV to reduce opportunistic infections such as toxoplasmosis, pneumocystis, parasitic diarrhea, bacterial pneumonia, malaria (primary prophylaxis) or the recurrence of a previously treated and cured infection (secondary prophylaxis). For this reason, management protocols recommend daily cotrimoxazole for PLHIV, whose clinical and/or biological status suggests it (OMS, 2017; Walker et al. 2010; De Sousa Moreira, 2015; Suthar et al., 2012).

This study had some limitations related to the retrospective nature of the data, based on the exploitation of routine data. Despite these limitations, the study has produced some fascinating results. The triangulation of data collection through several sources (ESOPE, physical registers), the exhaustive nature of the sampling, and the adjustment of factors in the multivariate analysis to control for confounding factors, plead in favour of the validation of the results of this research.

Conclusion

The results of this cohort study indicate that the mortality and LTFU incidence after ART initiation at Boromo were high. This situation constitutes a challenge to achieving the 90-90-90 objectives (ONUSIDA, 2014). Young age at ART initiation and HIV2 infection were predictive of LTFU. While being at an advanced WHO clinical stage and lack of cotrimoxazole prophylaxis were predictive of mortality. These findings highlight the urgent need to reduce the LTFU and mortality after ART initiation among HIV-infected patients. Strategies targeting identified risk factors and based on strengthening therapeutic education and community health workers search for LTFU would lead to better ART outcomes.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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