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Retention in Care among People Living with Chronic Hepatitis B Virus Infection in Burkina Faso: A 17-Year Retrospective Cohort Study

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Abstract

Background/Aim: Retention in care remains a major challenge in the care programs for people with chronic Hepatitis B virus (PL-HBV). This study aimed to evaluate non-retention in care and identify its associated factors among PL-HBV in the HEPSANET cohort at the Yalgado Ouédraogo University Hospital. **Patients and Method:** This was a retrospective, analytical cohort study conducted over 17 years (January 2006-January 2023). People living with the hepatitis B virus who were at least 18 years old and who did not have decompensated cirrhosis or a hepatocellular carcinoma (HCC) at the time of inclusion were included in the study. **Results:** This study included 569 patients with a mean age of 32.92 years. The majority were men (58.9%) and had a high level of education (university) (78.7%). A family history of the first degree of hepatocellular carcinoma (HCC) was found in 10.5% of patients. Considering body mass index, 22.8% were overweight and 11.9% were obese. Biologically, HBeAg was negative in 84.8% of patients, and the viral load was less than 2000 IU/mL in 58.5%. Evaluation of liver fibrosis showed that 62.8% of patients had mild fibrosis (F0 - F1). The median survival time was 4.12 years. (IQC: 3:35 - 4:89). The retention rate in care was 67.47% at 01 year old, 55.68% at 03 years old, 45.51% at 05 years old, 30.61% at 10 years old, and 12.03% at 15 years. Factors significantly associated with non-retention among people living with

chronic hepatitis B included male sex [adjusted HR 0.58; 95% CI: 0.35 - 0.96], secondary education level [adjusted HR 1.74; 95% CI: 1.00 - 3.02], overweight [adjusted HR 0.72; 95% CI: 0.54 - 0.97], obesity [adjusted HR 0.39; 95% CI: 0.24 - 0.64], and initiation of antiviral treatment [adjusted HR 0.36; 95% CI: 0.28 - 0.47]. **Conclusion:** Our study revealed low retention in care among people living with chronic hepatitis B, particularly among women and untreated patients, with a progressive decline over time. It is necessary to intensify the sensitization of in order to maintain them in care.

Keywords

Chronic Hepatitis B, Retention in Care, Associated factors, Burkina Faso

1. Introduction

Chronic hepatitis B virus (HBV) infection remains a major global public health issue, with an estimated 257.5 to 296 million individuals infected in 2022 and over one million deaths annually [1]-[3]. Sub-Saharan Africa is particularly affected, with prevalence rates reaching up to 20%; in Burkina Faso, the prevalence is estimated at 9.1% [4]. Recommendations from the WHO and scientific societies emphasize lifelong follow-up for HBV patients, including regular monitoring and antiviral treatment for those who meet eligibility criteria [5]-[7]. However, retention in care remains a significant challenge, particularly in sub-Saharan Africa, due to factors such as healthcare provider-patient relationships, financial constraints, and stigma [8] [9].

In Burkina Faso, although a national program for the management of viral hepatitis exists, it suffers from chronic underfunding and lacks sufficient resources for widespread implementation. Access to antiviral treatment and regular monitoring remains largely out-of-pocket for most patients, as there is no universal health coverage.

Furthermore, the management of HBV is currently restricted to hepatogastroenterology specialists, who are mainly located in a few urban centers. Consequently, patients in rural or remote areas often have to travel long distances to receive care, which creates a significant barrier to retention.

Studies have demonstrated highly variable retention rates, ranging from 18% over 18 months in Ouagadougou to 51.3% over one year in Sierra Leone [10] [11]. While retention has been extensively studied in the context of HIV and other chronic diseases [12] [13], data on HBV remain scarce. This study aims to assess retention in care among people living with HBV (PLHBV) in Burkina Faso and to identify associated factors. It is the first to report long-term (17-year) retention data and associated factors among PLHBV in Burkina Faso, using real-world clinical data from the HEPSANET cohort. This work fills a critical gap in the literature and provides evidence that can inform local policy and healthcare strategies.

2. Patients and Methods

This retrospective cohort study spanned 17 years, from January 2006 to January 2023. It involved individuals aged 18 and older living with HBV and receiving care at the Hepato-Gastroenterology Department of CHUYO, with their data recorded in the HEPSANET database. We excluded patients with hepatocellular carcinoma (HCC), decompensated cirrhosis at the entry into care, or those with missing data on the outcome of interest (retention). Patients with decompensated cirrhosis and hepatocellular carcinoma were excluded because their care pathways (including follow-up frequency and reasons for drop-out) differ from those of patients in the chronic, compensated stage. We aimed to analyze retention in routine HBV follow-up, outside of advanced or terminal disease stages.

Data were extracted from the HEPSANET REDCap database and analyzed using Stata version 16. Data are collected by trained clinical staff directly involved in patient care. All data collectors have received specific training in data entry procedures and use of the REDCap platform. Data quality is overseen by data managers recruited by the HEPSANET coordinating center, based at the MRC Unit, The Gambia, at LSHTM. These data managers regularly send data queries to local teams to resolve inconsistencies, missing values, or data entry errors. This rigorous quality control process ensures the validity and reliability of the data used in the study.

Kaplan-Meier survival analysis was used to estimate cumulative retention rates, and Cox proportional hazards with time-fixed covariates regression was performed to identify factors associated with non-retention. Results are reported as hazard ratios (HR) with 95% confidence intervals and p-values. Multivariate analysis used backward stepwise selection starting with variables with $p \leq 0.30$, retaining only those with $p \leq 0.05$ in the final model.

The primary outcome was non-retention in care, defined as the absence of any contact (clinical visit, phone call, or laboratory examination) for more than one year after the last recorded follow-up. Patients who had died, achieved HBsAg seroclearance, or were transferred were right-censored. Engagement in care was defined as at least one visit to the Hepato-Gastroenterology Department, with the date of the first consultation considered the start of follow-up. The censoring date was August 30, 2024.

3. Results

3.1. Patient Characteristics

From 619 patients recorded in the HEPSANET database in January 2023, 569 were included in the final analysis after applying eligibility and exclusion criteria. The follow-up outcomes are detailed below (**Figure 1**).

- Socio-demographic Characteristics

The mean age of participants was 32.92 ± 10.14 years (range: 18 - 74), with 87% under the age of 45. Men accounted for 58.9% of the cohort (sex ratio: 1.43). Alcohol misuse was reported in 3.3% of cases (**Table 1**).

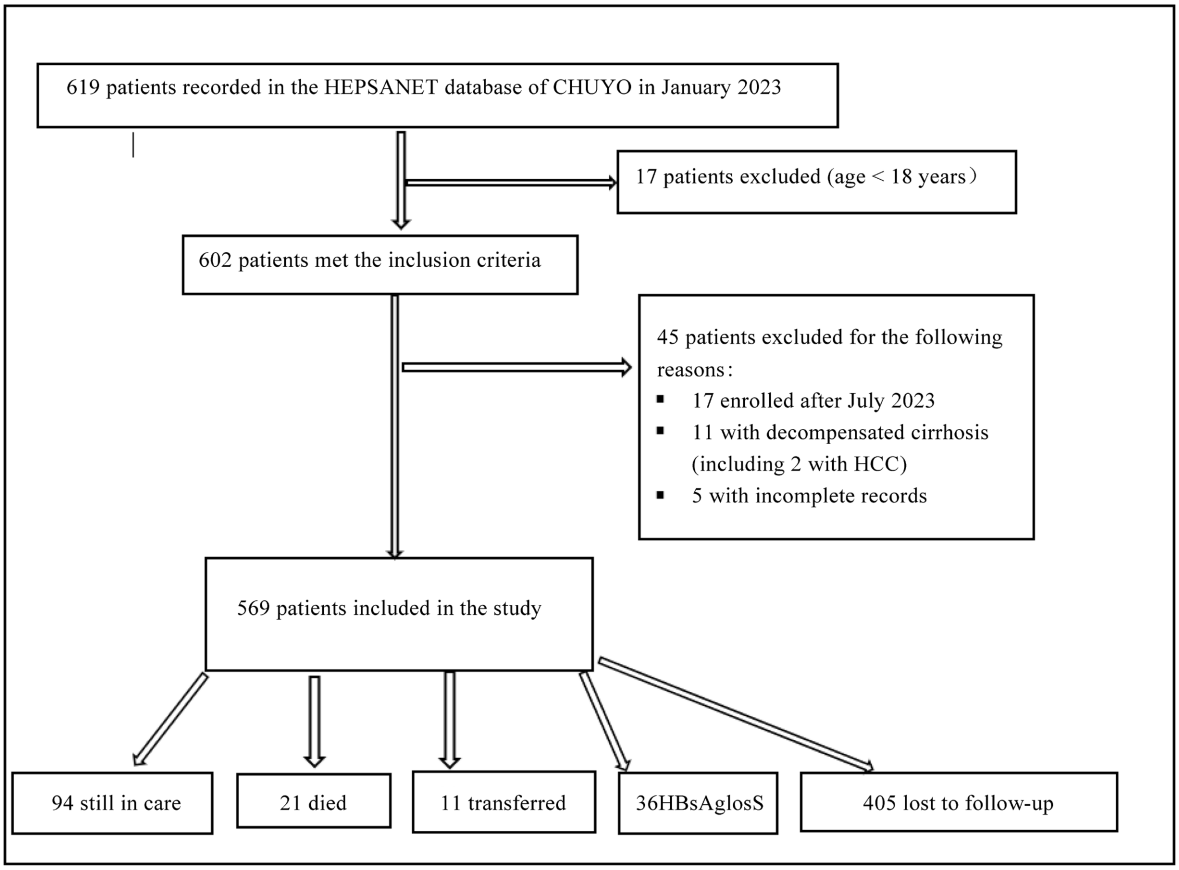

Figure 1. Flow chart of patient inclusion and follow-up outcomes in the HEPSANET cohort in January 2023.

Table 1. Socio-demographic characteristics.

Variable	n	%
Male	335	58.9
Female	234	41.1
<30 years	246	43.2
30 - 45	247	43.4
45 - 60	65	11.4
≥60	11	2.0
No education	34	7.8
Primary	10	2.3
Secondary	48	11.1
Higher education	342	78.7

➢ Clinical Characteristics

Approximately 10% of patients reported a family history of HCC at the first degree of HCC. In 88.3% of cases, HBV was discovered through routine screening. Nearly three-quarters of patients enrolled in care within one year of HBV diagnosis. Overweight and obesity were observed in 22.8% and 11.9% of patients, respec-

tively (Table 2).

Table 2. Clinical characteristics.

Variable	n	%
Family history of HCC	55	10.5
Routine screening	466	88.3
<1 year to enrollment	418	73.8
BMI < 25	350	65.3
Overweight (25 - 30)	122	22.8
Obese (≥30)	64	11.9

➢ Biological Characteristics

About 30% of patients had elevated ALT levels (≥40 UI/L), and 58.5% had HBV DNA levels < 2000 IU/mL. HBeAg was positive in 15% of patients, and prothrombin time was normal in 76% of cases (Table 3).

Table 3. Biological characteristics.

Variable	n	%
ALT ≥ 40	160	30.1
HBV DNA < 2000 IU/mL	249	58.5
HBeAg Positive	66	15.2
Normal PT	170	76.2

➢ Morphological Characteristics

Significant fibrosis (APRI ≥ 0.5) was observed in 25.3% of patients, with less than 15% presenting with advanced fibrosis. Abdominal ultrasound was normal in over 90% of cases (Table 4).

➢ Therapeutic Characteristics

More than half (53.1%) of patients were on antiviral therapy, with tenofovir disoproxil fumarate (TDF 300 mg) being the most commonly used drug (Table 4).

Table 4. Therapeutic characteristics.

Variable	n	%
On antiviral treatment	267	53.1
TDF	177	68.3
3TC + FTC	59	22.8

3.2. Retention in Care

The maximum follow-up duration was 6409 days (17 years), corresponding to

2606.5 person-years. The median retention time was 4.12 years (IQR: 3.35 - 4.89). Among 569 patients, 21 deaths were recorded (mortality rate: 3.7%), and 404 were lost to follow-up (71.2%).

Retention rates were 67.5% at 1 year, 55.7% at 3 years, 45.5% at 5 years, 30.6% at 10 years, and 12.0% at 15 years (Figure 2).

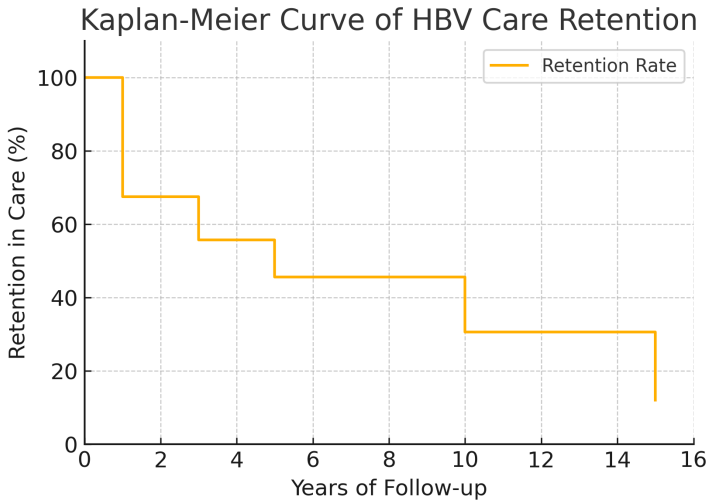

Figure 2. Kaplan-Meier curve showing retention in care over time.

➢ Factors Associated with Retention

In multivariate analysis, sex, education level, BMI, and treatment initiation were significantly associated with retention (Table 5).

- Male sex was associated with better retention (HR = 0.75; 95% CI: 0.59 - 0.96; p = 0.026).
- Overweight and obesity were protective factors (HR = 0.72 and 0.39 respectively; p < 0.001).
- Initiation of antiviral treatment was strongly associated with better retention (HR = 0.36; 95% CI: 0.28 - 0.47; p < 0.001).
- Secondary education was paradoxically associated with poorer retention.

Table 5. Factors associated with non-retention (multivariate Cox regression).

Variable	HR	95% CI	p-value
Male (ref: Female)	0.75	0.59 – 0.96	0.026
Overweight	0.72	0.54 – 0.97	<0.001
Obesity	0.39	0.24 – 0.64	<0.001
Treatment (Yes vs No)	0.36	0.28 – 0.47	<0.001

4. Discussion

This study highlights the relatively low retention in care among PLHBV in Burkina Faso. Only 67.5% of patients remained in care after one year, decreasing

to 45.5% at five years and 30.6% at ten years. These findings align with previous studies in Africa and the United States. For example, Soudré *et al.* [14] reported 73.5% retention at two years in Burkina Faso, while Desalegne *et al.* [15] found 50.2% retention at five years in Ethiopia. In contrast, higher rates are reported in European settings, such as the UK, where Mutimer *et al.* [16] observed 73.2% retention at five years and 55.6% at fifteen years.

Several barriers may explain these low rates. Lack of awareness about the disease, financial constraints, and the absence of a robust hepatitis B program (as exists for HIV) all play a role. Many patients fail to appreciate the importance of regular follow-up until complications arise.

To improve retention, strategies proven effective in HIV care could be adapted, such as decentralization, community support, patient education, and broader access to treatment, which could significantly enhance outcomes.

The analysis also revealed that men were more likely to remain in care. This may reflect sociocultural dynamics influencing healthcare access. Interestingly, patients with a secondary education level had lower retention, warranting further investigation. Several hypotheses may explain this result. One possibility is that this group may be more mobile due to work or educational opportunities, which can disrupt regular follow-up. Additionally, their perception of the disease as asymptomatic or not severe may reduce their motivation to remain engaged in long-term care, especially in the absence of immediate symptoms. We recommend that future qualitative studies explore these hypotheses.

Retention was better in overweight or obese individuals, possibly reflecting greater socioeconomic stability [17]. We appreciate this comment and have expanded the discussion accordingly. We now mention a local study conducted in Ouagadougou (Savadogo *et al.*, 2020), which found a strong positive association between higher BMI and higher socioeconomic status. We also discuss the alternative hypothesis that overweight and obese patients may have more comorbidities, prompting more frequent healthcare visits and thus better retention. We acknowledge both mechanisms as potentially relevant.

Finally, starting antiviral therapy was strongly associated with sustained care, consistent with findings from studies in Sierra Leone, Germany, Greece, Australia, and French Guiana [18]-[22], although not in Italy [23].

5. Strengths and Limitations

This 17-year retrospective cohort study provides valuable insights into long-term retention in HBV care. The exhaustive sampling and large dataset allowed for robust survival analysis and identification of key factors. However, the retrospective design of our study limited the collection of certain potentially relevant variables, such as occupation, place of residence, and aspects of healthcare system organization. Additionally, the presence of missing data may have introduced some degree of bias. Finally, while the study was conducted in the largest tertiary care center in Burkina Faso, its findings may not be fully generalizable to rural areas

or to other countries in West Africa. Variations in healthcare infrastructure, access to services, and patient demographics could affect the external validity of our results.

6. Conclusion

Retention in care among PLHBV in Burkina Faso remains inadequate and declines sharply over time. Factors such as gender, education level, BMI, and treatment initiation significantly influence patient retention. Interventions inspired by successful HIV care models such as improved patient education, decentralization of services, and expanded treatment access are urgently needed to improve long-term outcomes for HBV patients.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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