

# Evaluation of Compliance to Clinical, Paraclinical and Therapeutic Follow-Up in Patients with Chronic Hepatitis B Virus at the Yalgado Ouedraogo University Hospital in Ouagadougou

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**How to cite this paper:** Ky, L.J.E., Zongo, A.R., Sanné, Z.S., Djibo, B.M.A., Zombré, A., Pare, S.L.E., Gnomou, P., Maikibi, A.-M.A., Traoré, D.M., Ousseini, F., Diallo, M.S., Hema/Soudré, S.M.O., Coulibaly, A., Somda, S. and Sombié, R.A. (2025) Evaluation of Compliance to Clinical, Paraclinical and Therapeutic Follow-Up in Patients with Chronic Hepatitis B Virus at the Yalgado Ouedraogo University Hospital in Ouagadougou. *Open Journal of Gastroenterology*, 15, 69-77.

<https://doi.org/10.4236/ojgas.2025.153007>

**Received:** December 26, 2024

**Accepted:** March 11, 2025

**Published:** March 14, 2025

## Abstract

**Aims:** To evaluate the clinical, paraclinical and therapeutic compliance of patients with chronic hepatitis B virus at the Department of Hepato-Gastroenterology in Yalgado Ouedraogo University Hospital. **Patients and Methods:** This is a prospective, descriptive and analytical cross-sectional study conducted over a period of 3 months on patients who were chronic carriers of the hepatitis B virus and who had given their consent. Compliance was assessed using the GIRERD adherence assessment test and the visual analogue scale (VAS). **Results:** A total of 104 patients were included, 61 of whom were men (58.6%). The mean age was 40.2 years with a standard deviation of 12.6 years. Sixty-three patients (60.6%) were treated with tenofovir. Three-quarters of the patients were compliant with their six-monthly clinical follow-up and 25% had adequate paraclinical follow-up. Tenofovir supply disruption was the cause of treatment discontinuation in 30.4% of cases. Factors associated with compliance were female sex, monthly income and age. Factors associated with regularity of the follow-up were distance, higher level of education and being



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a shopkeeper. **Conclusions:** Our study showed good compliance to clinical follow-up but an inadequate adherence to paraclinical follow-up. A good understanding of the determinants of compliance is needed to incorporate them into clinical practice to ensure optimal patient care.

## Keywords

Compliance, Medical Follow-up, Hepatitis B, Africa

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## 1. Introduction

Infection and/or chronic viral hepatitis B is a worldwide public health problem and a cause of chronic liver disease. The age-dependent seroprevalence of hepatitis B virus varies from an area to another, and may be explained by the existence of different transmission modes of the virus. Worldwide, an estimated 296 million people are chronic HBsAg carriers [1]. Sub-Saharan Africa is located in an area of high hepatitis B virus (HBV) endemicity, with around 60 million of its population infected with HBV [2]. According to the World Health Organization (WHO), the prevalence of hepatitis B virus infection in Burkina Faso is 10.1% [3]. In 2022, around 1.1 million people worldwide died from HBV related chronic liver disease and this hepatitis B virus-related mortality is expected to continue to rise as populations age in regions with high HBV prevalence, such as the Western Pacific and Africa [4]. This mortality is mainly due to the complications of the chronic infection such as cirrhosis and primary liver cancer (PBC).

Chronic hepatitis B infection requires regular clinical and paraclinical follow-up, with or without an indication for treatment, in order to avoid or slow down its progression towards complications. To ensure adequate follow-up of the disease, good compliance of patients is essential. Indeed, lifelong follow-up is necessary for people with chronic B viral infection, whether or not they are currently candidates for treatment, as they could become so in the future [5]. Therapeutic compliance reflects the frequency with which a patient agrees to follow his or her doctor's recommendations concerning a given therapeutic program. Non-adherence is a frequent problem in the management of chronic diseases, whether in general practice or in the various medical specialties [6]. Haynes defines "therapeutic compliance" as "the extent to which an individual's behaviours (in terms of taking medication, following a diet or changing lifestyle) matches with medical or health advice" [7].

While compliance to treatment in chronic diseases is sometimes problematic, it is even more so in our day-to-day practice, where the majority of our patients are responsible for the entire work-up. The aim of this study was to assess clinical, paraclinical and therapeutic compliance among patients chronically infected with hepatitis B virus in the hepato-gastroenterology department of Yalgado Ouedraogo University Hospital.

## 2. Patients and Methods

This was a descriptive and analytical cross-sectional study with prospective collecting lasting three months (October 2022 to January 2023). The study population consisted of patients chronically infected with the hepatitis B virus followed at the hepato-gastroenterology department of the Yalgado Ouedraogo University Hospital.

All patients with chronic hepatitis B infection (HBsAg positive for more than 06 months), who had been followed for at least 6 months at the time of the study, who were over 15 years of age and who had given informed consent to participate in the study, were included in our study.

Who were not included:

- Patients hospitalized during the study period
- Patients with co-infection: HBV-HCV (hepatitis C virus), HBV-HIV (human immunodeficiency virus), HBV-HDV (hepatitis D virus)
- Pregnant women

Our patients were recruited on the basis of simple random sampling.

Therapeutic compliance score was determined using the GIRERD therapeutic adherence assessment test and the visual analog scale (VAS).

- GIRERD assessment test [8]

The compliance score was calculated using the GIRERD medication adherence assessment test. The GIRERD questionnaire comprises 6 questions which assess compliance with medication treatment. The questions took into account: the regularity with which medication is taken, whether treatment is broken, whether medication is forgotten, and the quantity of medication to be taken. Patients were divided into three groups:

- good compliance: no “yes” answers (total “yes” equals 0);
- minimal compliance problems: one or two “yes” answers are noted;
- poor compliance: when three or more “yes” answers are noted.

- Visual analog scale test

Using a questionnaire, compliance with treatment is assessed over the last 3 months using a visual analog scale (VAS) going from 0 to 10 (0 = no treatment taken to 10 = no medication forgotten). Compliance classes are divided into:

- total compliance (no missed doses, VAS score 10);
- moderate compliance (overall compliance with medication over the last 4 weeks, VAS score 8.1 to 9.9);
- non-adherence (poor compliance or discontinuation of treatment in the last 4 weeks, VAS score  $\leq$  8).

### Operational definitions

- Follow-up quality
  - Realization of requested paraclinical examinations: Quantitative HBsAg, transaminases and HBV viral load semi-annually; abdominal Doppler ultrasound and FIBROSCAN annually.
  - As a criterion of good compliance, we defined the realization of these tests

within three (3) months of the date of their prescription. Failure to carry out paraclinical examinations within 3 months of the date of prescription was defined as poor compliance.

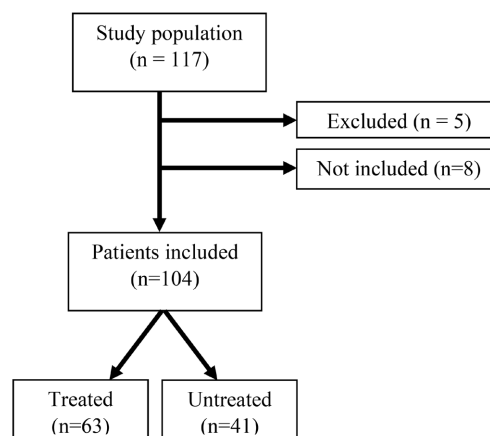
- Compliance with annual appointments
  - Good compliance to appointments: patients kept their two annual appointments with their doctor.
  - Poor compliance to appointments: one or none of the two annual appointments were respected.
- Regularity of follow-up
  - Good follow-up: appointment kept for the last 6 months.
  - Poor follow-up: appointment not kept for last 6 months.

### 3. Results

#### General Characteristics of the Study Population

One hundred and seventeen chronic hepatitis B virus carriers were enrolled. Eight had been diagnosed for less than six months, and five had a co-infection (HCV, HDV or HIV).

A total of 104 patients were included in our study (**Figure 1**).



**Figure 1.** Flow chart of the study population.

The study population was 58.6% male, for a sex ratio of 1.4. The mean age was  $40.2 \pm 12.6$  years. The 35 - 50 age group was the most represented, with 42.3% of cases. More than a third of patients (37.3%) had completed higher education. Eighty-one patients (77.9%) lived in urban areas, and a third of our patients were civil servants. Medical and paramedical expenses were covered by 72% of our patients, and none had health insurance.

#### Assessment of clinical and paraclinical follow-up

Over the last 6 months, 76% of patients had a good clinical follow-up. Paraclinical follow-up was poor in three-quarters of cases (**Table 1**).

#### Assessment of treatment compliance

Sixty-three patients (60.6%) were treated with tenofovir. Out of those 63 pa-

tients, 56 of them had forgotten to take their medication at least once. Nearly two-thirds of patients (63.5%) did not take their medication at set times. Nineteen patients had experienced a drug shortage. Treatment had already been interrupted in 36.5% of cases. The main cause of treatment interruption was a break in supply of the drug distribution chain (30.4%).

**Table 1.** Distribution of patients according to compliance with clinical and paraclinical follow-up.

Follow-up compliance	Number	Percentage (%)
<b>Clinical follow-up</b>		
Good compliance	79	76
Poor compliance	25	24
<b>Paraclinical follow-up</b>		
Good compliance	26	25
Poor compliance	78	75

**Table 2** and **Table 3** show the distribution of patients according to GIRERD score and visual analog scale.

**Table 2.** Distribution of patients by GIRERD score.

GIRERD score	Number	Percentage (%)	Interpretation
0	17	27	Good compliance
1	16	25.4	Minimal compliance problem
2	20	31.7	
3	9	14.3	Poor compliance
4	1	1.6	

**Table 3.** Factors associated with compliance in univariate analysis according to VAS.

Variables	Compliances			Total N = 63 (%)	P value
	Non compliance n = 8 (%)	Moderate compliance n = 16 (%)	Total compliance n = 39 (%)		
<b>Gender</b>					
Female	1 (1.6%)	5 (7.9%)	23 (36.5%)	29 (46%)	0.023
Male	7 (11.1%)	11 (17.5%)	16 (25.4%)	34 (54%)	
<b>Age</b>					
≤55 years	8 (12.7%)	16 (25.4%)	29 (46%)	53(84.1%)	0.021
>55 years	0 (0%)	0 (0%)	10 (15.9%)	10(15.9%)	

## Continued

<b>Time of day medication is taken</b>					
Morning	6 (9.5%)	6 (9.5%)	20 (31.7%)	34 (54%)	0.54
Evening	6 (9.5%)	7 (11.1%)	16 (25.4%)	29 (46%)	
<b>Residence</b>					
Semi-urban	4 (6.3%)	4 (6.3%)	8 (12.7%)	16 (25.4%)	0.3
Urban	4 (6.3%)	12 (19%)	31 (49.2%)	47 (74.6%)	
<b>Level of education</b>					
None	1 (1.6%)	0 (0%)	4 (6.3%)	5 (7.9%)	0.4
Primary	0 (0%)	1 (1.6%)	5 (7.9%)	6 (9.5%)	
Secondary	3 (4.8%)	7 (11.1%)	20 (31.7%)	30(47.6%)	
University (Or higher)	4 (6.3%)	8 (12.7%)	10 (15.9%)	22(34.9%)	

**Factors associated with treatment compliance**

- **Univariate analysis**

Factors associated with compliance were: age and female gender (**Table 3**).

- **Multivariate analysis**

In multivariate analysis, monthly income (>200,000FCFA/month) was associated with treatment compliance with  $p = 0.016$ .

**Factors associated with follow-up quality**

There was a significant association between good clinical follow-up and level of university education ( $p = 0.0014$ ), and business profession ( $p = 0.0093$ ). Distance of more than 50 km from the hospital was associated with poor clinical follow-up ( $p = 0.0121$ ).

**4. Discussion**

The mean age of our patients was  $40.2 \pm 12.6$  years. Our results are similar to those of Sombié *et al.* in Burkina Faso, where the mean age was 40 [8]. They are also close to those of Anzouan-Kacou *et al.* who reported a mean age of  $42.9 \pm 12.2$  years, in Ivory Coast [9]. In a study of patients with chronic hepatitis B and C infection in Burkina Faso, Zohoncon *et al.* reported a mean age of  $37.2 \pm 12.2$  [10]. These results show that our patients are young. This young age could be explained by the mode of transmission of the hepatitis B virus. Indeed, in our context, hepatitis B virus infection most often occurs at birth via the maternal-fetal route, or during childhood [11]. Chronic HBV infection is one of the main causes of cirrhosis and primary liver cancer [12]. It therefore requires regular monitoring, with or without the need for treatment to prevent progression to its main complications. In our context, some patients have been monitored or treated for chronic viral B infection since a young age.

The predominance of men found in our study is in line with the literature [8] [9] [13]. It could be explained by the cost of follow-up (medical consultation and

complementary examinations) and treatment of chronic B viral infection. In Burkina Faso, unemployment is more pronounced among women than men aged from 15 and over (5.6% versus 3.1%). Women are also more likely to be outside the workforce, as they are more confined to domestic work [14].

Over the last six months, 76% of patients had good clinical follow-up. However, paraclinical follow-up was poor in three quarters of cases. This difference could be explained by the lack of universal health insurance in our context. So the costs of medical consultations and complementary examinations are covered by our patients or their relatives. Financial difficulties are therefore one of the factors hindering proper follow-up of patients with chronic B viral infection. In Ivory Coast, Anzouan-Kacou *et al.* noted that patients did not undergo the entire initial HBV check-up. In fact, only half of the initial check-up was carried out. They also observed a regression in the completion of the follow-up check-up during the six-monthly visit [9]. In Congo-Brazzaville, Mongo-Onkouo *et al.* found that patients without health insurance were unable to afford the costs of HBV diagnostic, pre-therapeutic and follow-up examinations, as they were responsible for the entire cost [13]. According to Anzouan-Kacou *et al.*, patients with health insurance had a higher proportion of quantitative HBsAg and B viral load tests during follow-up than patients without insurance [9]. More than half of patients of our study were treated with tenofovir. Compliance with treatment was assessed by 2 methods: the GIRERD score and the visual analog scale (VAS). Compliance was good in 27% of patients according to the GIRERD score and in 61.9% of patients according to the VAS. This difference could be explained by the parameters taken into account in the two tests. The visual analog scale only takes into account forgetfulness, compliance and discontinuation of treatment in the last 4 weeks by the patient [15]. As for the GIRERD score, its parameters were forgetfulness, lack of medication, delay in taking medication, presence of memory impairment about medication taking, doubt about effectiveness and perception of tablet quantity [16]. For some authors, the method of assessing compliance by questioning tends to overestimate compliance due to memory bias, and sometimes the patient only says what the doctor wants to hear [17] [18].

In univariate analysis, female gender and age > 55 years were the 2 factors associated with compliance. In our context, women are considered to be the pillars of the family and may therefore be more compliant with treatment in order to preserve their health. As far as age is concerned, Adoubi *et al.*, in Ivory Coast in a study of treatment compliance among subjects with high blood pressure noted that young age was a risk factor for non-compliance [17]. In multivariate analysis, there was an association between compliance and monthly income (>200,000 FCFA/month). The absence of universal health insurance in Burkina Faso could explain this result. Indeed, the purchase of tenofovir is at the expense of our patients. A higher level of education and the profession of trader were associated with the quality of clinical follow-up. Patients with a higher level of education benefit from a better level of information about viral hepatitis and its possible

complications. This could explain their regular attendance to medical appointments. According to Scheen *et al.* the knowledge and beliefs of patients, and those around them, can also play an important role in patients compliance [19]. The costs of consultations and paraclinical examinations are covered by our patients. Patients with a better financial situation, such as shopkeepers, are more likely regular at their medical appointments. Anzouan-Kacou *et al.* and Pourette *et al.* made a similar observation in Ivory Coast [9] [20]. According to Anzouan-Kacou *et al.*, living conditions and financial difficulties in carrying out pre-treatment assessment and follow-up check-ups are generally the reasons why follow-up is interrupted [9]. This could also explain the relationship between distance from the hospital (>50 km) and poor clinical follow-up found in our study. The introduction of universal health insurance, a reduction of the distance between patients and their GP could contribute to an improvement in the quality of clinical and paraclinical follow-ups. This could also improve therapeutic compliance of patients living with chronic hepatitis B infection in our context.

## 5. Conclusion

Our study revealed a good clinical follow-up but an inadequate paraclinical monitoring. In our working context, marked by a high prevalence of chronic B viral infection and the absence of universal health insurance, a good knowledge of the determinants of compliance is necessary in order to be able to integrate them into our daily clinical practice and thus ensure optimal care for patients.

## Conflicts of Interest

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

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