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Epidemiological, Clinical and Biological Characteristics of Patients with Chronic Hepatitis B Infection Followed-Up at the University Hospital of Conakry, Guinea

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Abstract

Introduction: Very little information is available in Guinea on chronic hepatitis B infections. The objective of this study was to describe the epidemiological, clinical and biological features of patients who are chronic carriers of the hepatitis B virus. **Patients and Methods:** This is a retrospective study carried out from January 2017 to May 2020, based on the medical records of patients seen via consultation or hospitalized with a record of positive HBs antigen for more than 6 months. Clinical and paraclinical data were collected and analyzed. **Results:** Seven hundred and sixteen patients with a mean age of 35.6 ± 12.2 (sex ratio 2.05), were included. The HBs antigen was discovered incidentally in 36% of cases (n = 258). A history of dental care and surgical procedures was found in 46.3% (n = 290) and 21.1% (n = 138) of cases, respectively. The median value of ALAT enzymes was 34 (21 - 47) IU/L. HBeAg was positive in 20.8% (n = 55/265) of cases. The median B viral load was 458.5 (87 - 3827) IU/ml and 29% (n = 94) of patients had a viral load over 2000 IU/ml. Anti-HCV antibody was present in 10.4 % of cases (n = 39/374). HIV serology was positive in 2.7% (n = 8/298). A total of 19.4% (n = 139) of the patients had cirrhosis and 4.5% (n = 32) had hepatocellular carcinoma. **Conclusion:** The discovery of chronic HBs antigen was mostly fortuitous in young sexually active men, some of whom were already at the stage of cirrhosis and hepatocellular carcinoma. The best prevention strategy against this infection remains early detection and vaccination.

Keywords

Viral Hepatitis B, Epidemiology, Clinical, Biology

1. Introduction

Hepatitis B virus (HBV) infection is a major public health condition affecting approximately 240 million people worldwide [1]. The natural history of HBV infection is variable, ranging from inactive carrier status to chronic hepatitis B, which can progress to cirrhosis and hepatocellular carcinoma [2]. Despite the existence of a preventive vaccine that is 95% effective, since 1982, hepatocellular carcinoma has been the second most deadly cancer in the world [3].

Management of chronic viral hepatitis B is costly, and prevention through screening and vaccination, either selected or generalized, remains the most effective strategy to reduce its incidence.

Sub-Saharan Africa is an area of high prevalence (8% - 15%) of HBV [4] [5] [6]. In Guinea, studies have been conducted on target populations. They have shown in prison settings, among people living with the acquired immunodeficiency virus and among diabetics, frequencies of 27.7%, 8% - 9%, and 8%, respectively [7] [8] [9] [10].

However, no data on a large population of chronic HBsAg carriers have been published.

The objective of this study was to describe the epidemiological, clinical and biological aspects of patients who are chronic carriers of HBsAg.

2. Patients and Methods

2.1. Setting

We conducted a retrospective study in the Internal Medicine Department of the Conakry University Hospital, from January 2017 to March 2020.

2.2. Population and Inclusion Criteria

We included all patients followed in ambulatory or hospitalized who had a persistent positive HBsAg for more than 6 months (confirmed by ELISA method). Patients with a negative HBsAg control within 6 months of initial diagnosis, reclassified as acute hepatitis, were excluded from the study.

2.3. Data Collection and Variables

Data were collected from patients' medical consultation and hospitalization records on an existing survey form. The study variables were: Epidemiological (age, sex, place of residence, marital status, occupation, risk factors); Clinical (mode of discovery, history, clinical signs); Biological (haemoglobin, platelets, prothrombin levels, blood transaminases, total bilirubin, creatinine, alpha fetoprotein, albumin, HBe antigen, hepatitis C antibody, HIV antibody, viral load B,

Fibrotest fibrosis score*); ultrasound and CT scan.

The diagnosis of cirrhosis was based on clinical, ultrasound and Fibrotest* results, and that of hepatocellular carcinoma on the results of liver CT scan.

For the evaluation of hepatic fibrosis by Fibrotest* only the higher values were taken.

2.4. Ethics and Deontology

The study was approved by the Ethics Committee of the University Hospital Center of Conakry in accordance with the Declaration of Helsinki.

2.5. Statistical Analysis

Continuous variables were expressed as mean and standard deviation or median and interquartile range, while categorical variables were expressed as a percentage. Data were analyzed with EPI INFO software, version 3.5.4.

3. Results

A total of 716 patients aged 35.6 ± 12.2 years, ranging in age from 5 to 73 years were included. Population's sex ratio was 2.05. About half of the population (45%) attended school in this study. According to marital status, most of the people (68.3%) were married. The study population resided mainly in Conakry, the capital city, in 74.7 percent of cases. The discovery of chronic HBsAg carriage was fortuitous in 36% of cases, followed by the diagnosis of physical asthenia in 14.6%. The main co-morbidities were dominated by hypertension in 6.42% of cases and diabetes in 4.32%. The notion of alcohol consumption was found in 103 patients out of the 552 responders (18.7%). Tobacco smoking was found in 16% of cases. These epidemiological characteristics are detailed in Table 1.

Risk factors were dominated by a history of dental care in 46.3% of cases, surgery in 21.1% of cases and scarification in 9.7% as shown in Figure 1.

The main clinical signs found were physical asthenia in 29.4% of cases (208/707), jaundice in 11.6% of cases (77/665) and hepatomegaly in 9.8% (63/646). These results are detailed in Table 2.

The biological characteristics of the sample are presented in Table 3. HBeAg was positive in 20.8% of the patients (55/265) and the mean B viral load was 441.5 of which 29% were above 2000 IU/ml at inclusion. The mean transaminase level of patients was 34 IU/ml (21 - 47) and the mean platelet level was 216,000/mm^3, ranging from 169,000 to 275,000. There was HIV-HBV co-infection in 2.7% (8/298) and HCV-HBV co-infection in 10.4% (39/374).

Fibrotest* showed an absence of fibrosis (F0) in 58.2% (110/189), minimal fibrosis F1 in 12.7% of cases (24/189) and significant fibrosis (F2-F3-F4) in 29% of cases including 12 cases of cirrhosis (6.3%).

Hepatocellular carcinoma was found in 32 patients (4.5%), 20 (64%) of whom had alpha fetoprotein levels greater than 400 IU/ml. Liver ultrasound was normal in

Table 1. Epidemiological characteristics of the study population.

Variables	Characteristics
Age mean ± standard deviation	35.59 ± 12.15
Gender (male), n (%)	482 (67.3)
Marital status n (%)	
- Married	489 (68.3)
- Single	203 (28.4)
- Widow/widower	15 (2)
- Divorced	9 (1.3)
Residence (%)	
- Conakry (capital city)	535 (74.7)
- Inland	164 (23)
- Abroad	17 (2.3)
Profession n (%)	
- Public officer	161 (22)
- Merchant	122 (17)
- Student	107 (15)
- Housewife	77 (11)
- Worker	59 (8)
- Health personnel	41 (6)
- Driver	34 (5)
- Military/Paramilitary	26 (4)
- Others	89 (12)

Table 2. Clinical features of the population at the time of diagnosis of hepatitis B.

Variables	Charactheristics
Diagnostic circumstances n (%)	
Incidental screening	258 (36)
Asthenia	105 (14.6)
Flu-like symptoms	91 (12.7)
Icterus	77 (10.7)
Ascitic-edematous syndrome	59 (8.2)
Chronic hepatopathy	35 (4.8)
Blood giving	30 (4.1)
Others	61 (8.5)
Comorbidities	
Hypertension	46 (6.42)
Diabetes	31 (4.32)
Alcohol	103/552 (18.7)
Smoking	88/550 (16)
Symptoms n/N (%)	
Asthenia	208/707 (29.4)
Icterus	77/665 (11.6)
Hepatomegaly	63/646 (9.8)
Splenomegaly	22/620 (3.5)
Collateral venous circulation	9/629 (1.4)
Ascitic-edematous syndrome	59/637 (9.3)
Digestive haemorrhage	7/585 (1.2)
Hepatic encephalopathy	5/638 (0.8)

Table 3. Biological chatacteristics of the population at the time of diagnosis of hepatitis B.

Variables	Mean ± SD/Median (Q1 - Q3)/n/N (%)
Positive HBe antigen	55/265 (20.8)
Anti-hepatitis C virus antibodies	39/374 (10.4)
HIV	8/298 (2.7)
Initial hepatitis B viral load (n = 324)	
≤2000 UI/ml	230 (71)
>2000 UI/ml	94 (29)
Fibrotest fibrosis score	
F0	110/189 (58.2)
F1	24/189 (12.7)
F2	32/189 (16.9)
F3	11/189 (5.8)
F4	12/189 (6.3)
Hemoglobin level in g/dl (n = 465)	12.7 ± 2.42
Blood platelet count/mm^3 (n = 337)	216,000 (169,000 - 275,000)
Aspartate aminotransferase in IU/ml (n = 431)	30 (21 – 43)
Alanine aminotransferase (n = 480) en UI/ml	34 (21 – 47)
Albuminemia in g/l (n = 129)	38.8 ± 13.7
Total bilirubin in mg/l (n = 275)	13 (7 - 20)
Blood creatinine in micromole/l (n = 263)	82 (63 - 96)
Prothrombin level (n = 219)	
≥70%	151 (68.9)
<70%	68 (31.1)
Alpha fetoprotein level (n = 294)	
≤10 UI/ml	197 (67)
>10 and ≤400 UI/ml	67 (26.2)
>400 UI/ml	20 (6.8)

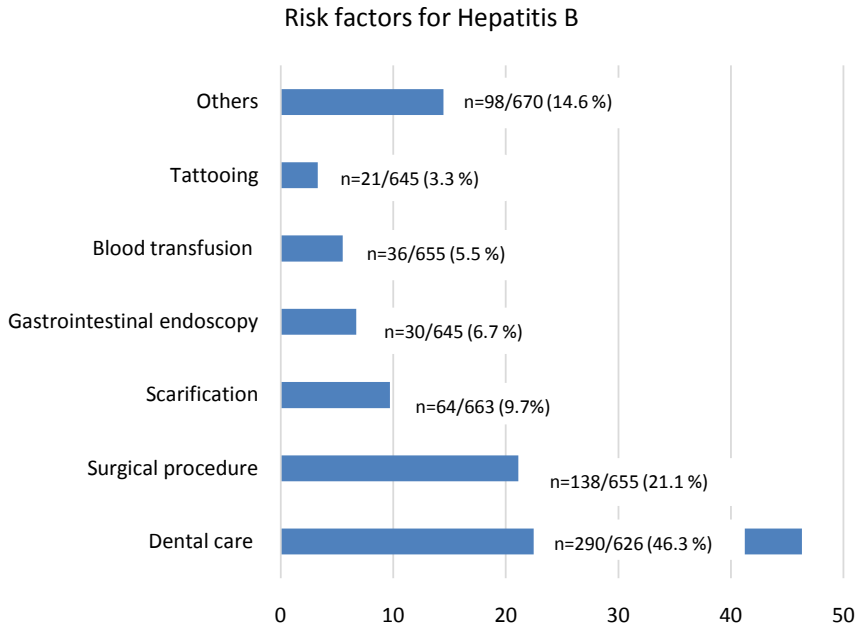

Figure 1. Risk factors for hepatitis B in the study population.

223 patients (55.2%); there was homogeneous hepatomegaly in 62 patients (15.3%), dysmorphic liver in 53 patients (13.1%), suspicious hepatocellular carcinoma nodules in 35 patients (8.7%), hepatic steatosis in 28 patients (6.9%) and atrophic liver in 3 patients (0.7%).

4. Discussion

This study involved a population of 716 patients, the majority of them were young adults between the ages of 27 - 42. These results are consistent with those of most African studies [6] [7] [8] [9] [11].

Men were the most affected by chronic hepatitis B with a sex ratio of 2.05. This result is consistent with other African studies [6] [12] [13]. This predominance could be explained by the male tropism of the hepatitis B virus as described in the literature [14].

The scholarized population was the most represented among the hepatitis B carriers in this study, which could be linked to the fact that this group is more accessible to sensitization and by ricochet to screening.

The diagnosis of viral hepatitis B made incidentally in 37.7% of cases is consistent with data from the African literature [13] [15] [16]. It's discovery during systematic screening seems to be related to the silent evolution of chronic HBsAg, a frequent mode of revelation in sub-Saharan Africa.

There was a notion of alcohol consumption in 18.7% of our study population, a rate higher than the one reported in the Prolifica study but lower by half than the one reported in a study conducted in Pointe Noire, Congo [11] [15]. Since alcohol is also hepatotoxic, its consumption increase the risk of progression to hepatic complications.

The main co-morbidities found were hypertension found in 46 patients (6.42%) and diabetes in 31 patients (4.32%). The Beninese study found 16.1% of hypertension and 4.3% of diabetes [6].

The main risk factors were dental care in 46.3% and surgical procedures in 21.1%. Kpossou *et al.* found scarification as the main risk factor in 37.8% of cases and non-medical circumcision in 22% of cases, surgery as a risk factor was found in 19.5%.

Oumar Traoré in his dissertation had also found dental care as the first risk factor in 15.6%, followed by tattoos in 11% and surgery in 7.1% of cases.

Dental care is described as a risk factor for HBV transmission in literature, but the causes of this transmission vary from one study to another. A study published by Rimland *et al.* found that contamination was primarily caused by a HBV-positive dentist who did not wear gloves during the procedure [17].

According to the 1995 study by Arboleda *et al.*, patients treated by non-professional dentists were 2.6 times more likely to be infected with HBV than those who received dental treatment by trained professionals [18]. However, surgery has been described as the medical profession associated with the higher risk of transmission of HBV [19].

The 2.7% rate of HBV-HIV viral co-infection is far lower than previously reported rates in Guinea in target populations with HIV infection [8] [9]. However, this rate is comparable to those reported in the Prolifica study and in Congo with 3.3% and 1.5% respectively [11] [15]. Another study performed in Tunisia found a higher proportion (5.64%) of HBV and HIV co-infection [20].

VHB and HIV co-infection is common, due to the fact that these two viruses share the same modes of transmission and risk factors. This co-infection is a pejorative factor in the prognosis because HIV infection accelerates the progression of hepatitis B to cirrhosis and hepatocellular carcinoma.

In addition, viral C co-infection was found in 10.4% of cases, a result higher than those reported by most African studies [6] [11] [13] [21].

In our series, 20.8% of patients were HBeAg positive, a rate higher than the one reported in the Prolifica study where the positivity of HBeAg ranged from 3.3% to 7.9%, but close to the 15.2% found by Lawson *et al.* in Ivory Coast [11] [22].

Less than half of the patients were able to perform the viral load assay, which is the essential marker for therapeutic indication and monitoring. In Guinea, as in most African countries, management remains a major difficulty in the absence of healthcare coverage.

Of the 189 patients who were able to perform the markers for evaluating hepatic fibrosis (Fibrotest*), 28.4% had significant fibrosis, of which 6.3% had cirrhosis.

According to the clinical signs, liver ultrasound and Fibrotest* we found 19.4% cirrhosis at diagnosis. This result is similar to the one reported by Diallo S. *et al.* in Senegal (22.11%) [16] but lower than the one found by Lawson *et al.* in the Ivory Coast (42.4%) [22]. Among the population with cirrhosis, 8.7% were at the stage of hepatocellular carcinoma with an AFP rate > 400 IU/ml found in 64 % of cases. This high rate of cirrhosis and hepatocellular carcinoma shows the lack of early diagnosis and treatment of this viral B infection in our context.

The progression of hepatic fibrosis to cirrhosis and hepatocellular carcinoma is due to the persistence of viral replication [23].

In this population, 166 patients were eligible for antiviral treatment according to EASL recommendations [3]. The main drug used was Tenofovir because of its high resistance barrier and its availability in our country despite its high cost.

The study had some limitations that should be pointed out. First, there was the lack of a registry in the Department to assess the weight of viral hepatitis B. Secondly, the lack of social security coverage was a barrier to perform the biological exams required for an appropriate follow-up. Indeed, only half of the patients performed the viral load while the evaluation of fibrosis was possible in a quarter of the patients.

However, this study was a descriptive approach to chronic hepatitis B in a large hospital sample that provided insight into the epidemiological, clinical and biological characteristics in an urban setting in a low-income country.

5. Conclusions

Chronic viral hepatitis B predominantly affected young adult males in this study, with a fortuitous finding in most cases. The main risk factors found were dental care and surgical procedures.

The high proportion of complications, especially from cirrhosis and hepatocellular carcinoma, found immediately upon diagnosis, is an indicator of insidious evolution and delay in the diagnosis of this infection in our context. Moreover, access to diagnostic and therapeutic tools remains a major challenge. Therefore, awareness on screening and vaccination is the best strategy to reduce hepatitis B infection.

Authors' Contribution

Djenabou Diallo coordinated the study, developed the protocol, collected data, participated in data analysis, structuring and writing the article (senior editor).

Kadiatou Diallo collected the data, reviewed the article and provided critique to improve the content.

Alpha Mamadou Diallo participated in the development of the protocol, analyzed the data, and participated in the structuring and writing of the article.

Mamadou Mansour Diallo and Thierno Amadou Wann took part in the elaboration of the protocol, reviewed the article and provided critiques to improve the content of the article.

Alpha Amadou Sank Diallo reviewed the article and provided critiques to improve the content.

Amadou Diouldé Doumbouya, Ousmane Sow, Youssouf Baldé collected the data and reviewed the article.

Conflicts of Interest

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

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