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Occult Hepatitis B and Advanced Chronic Liver Disease at the University Hospital of Libreville (Gabon)

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Abstract

Introduction: *Occult hepatitis B is a common but poorly described condition in Gabon. The objective of this study was to identify occult hepatitis B as a probable cause of cirrhosis of unknown etiology.*

Materials and Methods: *This was a prospective, descriptive, and analytical cross-sectional study conducted in the Hepatogastroenterology Department of the Libreville University Hospital between January 1 and December 31, 2022. We included all volunteer patients being treated for cirrhosis. We excluded patients with cirrhosis of viral hepatitis B, viral hepatitis C, or alcoholic etiology. Patients with cirrhosis of unknown etiology underwent real-time PCR for hepatitis B genome detection and concurrent measurement of HBc and HBs antibodies. Sociodemographic data, medical history and risk factors, as well as diagnostic data, were collected. Data analysis was performed using R software version 4.1.1.*

Results: *We had 33 patients with cirrhosis of unknown etiology, 13 of whom had occult hepatitis B with a low detectable HBV viral load in serum (39.39%). HBc antibodies were present in 100% of these patients, and HBs antibodies in 30.77%. The male-to-female ratio was 1.6, with a mean age of 43.8 ± 9.3 years. The cirrhosis was classified as Child- Pugh C in 76.92% of cases, and hepatocellular carcinoma was present in 23.08%. Factors associated with HBO (Table II) were the notion of vaccination against HBV (OR 2.12 [1.8-3.18], p 0.015), the notion of a parent with hepatitis B (OR 1.8 [1.56-2.14] p 0.041); the notion of blood transfusion (OR 2.05 [1.07-3.62] p 0.024) and ritual scarifications (OR 1.91 [1.66-2.98].*

Conclusion: *Occult hepatitis B is a common cause of presumed cryptogenic cirrhosis.*

Keywords: Occult Hepatitis B, Cirrhosis, Hepatocellular Carcinoma, Gabon.

Introduction

Occult hepatitis B (OHB) is defined as the presence of a low viral load of the hepatitis B virus (HBV) in the liver or serum in the absence of surface antigen (HBsAg) [1]. By definition, OHB falls outside the usual rules for hepatitis B virus (HBV) screening, which relies on the systematic detection of HBsAg [1-4]. It requires highly sensitive molecular biology detection techniques such as polymerase chain reaction (PCR). chain reaction (PCR) [1-4]. Its involvement in advanced chronic liver diseases such as cirrhosis and primary liver cancer is increasingly accepted [1-6]. African data are sparse and focused on the risk of transmission through blood donation [2-8]. In Gabon, Bivigou et al. reported the presence of HBO in 17.5% of HIV patients followed [9]. Its existence in HIV-negative patients could explain the presence

of a significant number of cirrhoses of unknown etiology. Thus, in order to reduce the frequency of cirrhosis presumed to be of cryptogenic origin, we investigated the role of HBO in its occurrence.

Patients and Method

This was a prospective, observational, and descriptive study conducted in the hepatogastroenterology department of the Libreville University Hospital. We included all volunteer patients followed for cirrhosis between January 1 and December 31, 2022, who were free of HBsAg and hepatitis C virus antibodies and did not consume alcohol. We systematically tested for the presence of the HBV genome by real-time PCR with an amplification cycle count of 32 or fewer. We systematically tested for positivity of anti- HBs and anti -HBc antibodies. We excluded patients receiving or having received antiviral treatment for HBV, as well as HIV-positive patients. In addition to sociodemographic data, we collected exposure factors. Data analysis was performed using R 4.1.1 software. Quantitative descriptive variables were expressed as mean with standard deviation when the distribution was normal, and as median and interquartile range otherwise. Qualitative variables were described as percentages. Uncorrected Pearson's chi-squared test and Fisher's exact test, as appropriate, were used to compare frequencies. The Student 's t-test was used for comparing means. Regarding ethical and regulatory aspects, consent was systematically obtained and data management was anonymous in strict compliance with international recommendations.

Results

During the study period, we collected 188 cases of cirrhosis, of which 70 were of hepatitis B viral origin (37.23%), 40 were of hepatitis C viral origin (21.28%), 45 were of alcoholic origin (23.94%), and 33 were of unknown etiology (17.55%). Among these 33 patients with cirrhosis of unknown etiology, 13 had a low detectable HBV viral load in serum (39.39%). Comparative analysis of these 13 patients with the 20 patients with an undetectable HBV viral load (Table I) revealed that all 13 patients (100%) had positive HBc antibodies and 4 patients (30.77%) had positive HBs antibodies. None of the other 20 cases of cirrhosis of unknown etiology had HBc or HBs antibodies. The sex ratio was 1.6, with a mean age of 43.8 ± 9.3 years in the HBO group versus 1.4 in the other group. Ten out of thirteen patients had Child- Pugh C cirrhosis, compared to fifteen out of twenty in the other group. Three of the thirteen patients (23.08%) had hepatocellular carcinoma, compared to four out of twenty patients (20%) in the other group. Only two out of 33 patients reported a vague history of liver disease in their mothers.

Table 1: Characteristics of cirrhotic patients according to the presence of an HBO

z	Cirrhosis with HBO (n = 13)	Cirrhosis without HBO (n = 20)	p
Average age (years)	43.8 ±9.3	44.5 ± 9.7	0.41
Sex ratio	1.6	1.4	0.56
Ac HBc (%)	100	0	0.00
Ac HBs (%)	30.77	0	0.00
Child- Pugh C (%)	76.92	75	0.38
Hepatocellular carcinoma (%)	23.08	20	0.14

The genotypes found were genotype E in 5 cases (38.46%), genotype D in 4 cases (30.76%), genotype D/E in 2 cases (15.38%), and genotype A in 2 cases (15.38%). Factors associated with HBO (Table II) were history of HBV vaccination (OR 2.12 [1.8–3.18], $p < 0.015$), history of a parent with hepatitis B (OR 1.8 [1.56–2.14], $p < 0.041$); history of blood transfusion (OR 2.05 [1.07–3.62], $p < 0.024$), and history of ritual scarification (OR 1.91 [1.66–2.98].

Table 2: Factors associated with the presence of an HBO

Risk factors associated with HBOT	Cirrhosis with HBO (n = 13)	Cirrhosis without HBO (n = 20)	p	GOLD
History of HBV vaccination (%)	76.92	30	0.015	2.12 [1.8-3.18]
Intrafamilial hepatitis B (%)	46.15	35	0.041	1.8 [1.56-2.14]
Transfusion (%)	69.23	50	0.024	2.05 [1.07-3.62]
Ritual scarifications (%)	84.62	70	0.038	1.91 [1.66-2.98]

Discussion

The prevalence of hepatitis B in patients with cirrhosis of unknown etiology was 39.39%. This high prevalence was suggested by several meta-analyses, which indicated that the risk is even greater in at-risk populations and in regions with high overall hepatitis B prevalence [10-12]. This situation raises questions for several experts regarding the effectiveness of the hepatitis B elimination strategy by 2030, which does not include addressing hepatitis B [13-15]. Systematic screening of at-risk individuals in countries with a high prevalence of hepatitis B is recommended but limited by its cost [13-15].

Furthermore, the presence of Child -Pugh C cirrhosis in 76.92% of cases and hepatocellular carcinoma in 23.08%, without other risk factors, supports the numerous observations implicating hepatitis B infection (HBI) in the development of these chronic complications [16-19]. Thus, among the risk factors associated with the development of HBI, although transfusion, a frequently

observed factor, was found, the notion of birth to an infected mother could not be specified because this information was too distant for the patients [20-22]. However, ritual scarification is a recognized African practice and a risk factor for viral hepatitis B and C in our experience [23, 24].

Regarding vaccination, some theories on the immunoregulatory mechanisms induced by vaccination have been suggested but remain to be further developed [25]. In addition, Guerlich et al had observed a high rate of occult HBO in blood donors vaccinated against hepatitis B, thus reinforcing the suspicion of the involvement of the vaccine in the occurrence of HBO [26]. This study, while limited to a small sample size, raises the issue of a public health problem that is likely underestimated in our country, especially since some studies suggest a higher incidence of hepatitis B in individuals co-infected with hepatitis C [27, 28]. A larger-scale study appears necessary to assess the extent of the situation.

Conclusion

Occult hepatitis B appears to be a frequent but poorly understood cause of suspected cryptogenic cirrhosis in our setting. It shares the same risk factors as classic hepatitis B and carries the same complications. Further analysis will help establish an appropriate control strategy.

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