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Full Length Research Paper

Viral Load B among students at Kara Universityin Togo

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Abstract

Hepatitis B virus is one of the silent viral threats. Its transmission is vertical and sexual, which makes it a risk for young people with high sexual activity. The objective of this study was to determine the viral load B in students enrolled in their first year of study at the University of Kara, a city in Togo. This was a descriptive cross-sectional study conducted from August to September 2021 among students who received a clinical examination and a biological check-up including screening for hepatitis B, C and HIV. Their consent was informed and positive patients were referred to the approved centers for management. Viral load was performed on Cobas Ampliprep, Roche Diagnostics ®. Of 600 students enrolled, HBsAg carriage was 15% (n= 92). Of these, 54 accepted to continue the study, the sex ratio (M/F) was 3.15; age ranged from 19 to 26. None of the students was symptomatic. Splenomegaly was found on ultrasound in 17% of them. Viral load was detectable in 79.6% (n=43). Most of them, 69.8% (n=30) had a viral load between 10 and 2000 IU/ml and 16.3% (n=7) had a viral load higher than 20,000 IU/ml. Viral hepatitis B in these students seems to have been acquired since childhood; education-information of the population of Kara is needed.

Keywords: AgHBs; HCV; HIV; prevalence; Viral load B, students; Togo.

INTRODUCTION

Hepatitis B virus (HBV) is an infection disease that affects the liver. This infection can be acute leading to death or chronic evolving hepatocellular insufficiency, cirrhosis or hepatocarcinoma. According to the World Health Organization, there are 257 million chronic cases and between 1-3 million deaths annually due to HBV(1). As such HBV's disease is a public health problem despite the availability of a vaccine to prevent the infection. Therefore, WHO recommends a HBV serological status screening in order to reduce or erase the HBV infection.

The prevalence of HBV in low-income countries is high, particularly in Sub-Saharan countries. About 70% of cases are found in Africa (2). However, in Togo, the national prevalence remains unknown, although local or population-specific studies have reported a prevalence between 10 to 19% (3,4). Consequently, a large proportion of the population ignores its HBV whether, or not they are HBV positive.

The routes of HBV contamination are maternal-fetal transmission, horizontal transmission through contact with infected individuals, parenteral transmission and sexual transmission. In principle, in Lomé – the capital - a high prevalence has been noted in the 20-29 year old age group, such as university population/students that sexually active (3). Therefore, to provide a representative information to enrich the national HBV prevalence in Togo, our study focused on Kara city, particularly its University. The objective was to determine the Hepatitis B viral load in students enrolled

in the first year and carrying the HBs antigen at the University of Kara.

MATERIAL AND METHODS

This was a descriptive cross-sectional study conducted from August to September 2021 among students enrolled in their first year at the University of Kara. Kara is the second largest city in Togo. It is about 400 km from the capital in the north of the country. The recruitment of students was voluntary. They were interviewed and examined by a medical doctor as part of the pre-registration process, followed by a biological screening. The inclusion criterion was HBsAg positive and students who refuse to participate were non-included. Among HBsAg-positive students, testing for anti-HBc, hepatitis C, and HIV Ab was performed followed by a hepatitis B viral load in students who provided verbal consent to continue the study. A liver workup [Alanine Amino Transferase (ALT), Aspartate Amino Transferase (ASAT), Gamma-Glutamyl Transferase (GGT), Alkaline Phosphatases (ALP)] and creatinine (Creat) were performed routinely for each student. A consultation followed by an abdominal ultrasound was also performed.
Note that verbal consent from each student was collected.

Screening for Hepatitis B, Hepatitis C and HIV

Blood samples were collected to obtain serum after centrifugation. Screening for HBsAg, Hepatitis C (HCV) and Human Immunodeficiency Virus (HIV) was performed by immunochromatography strip technique (ONE-step, Qingdao Hightop Biotech Co, Ltd, China). The samples were analyzed in the laboratory of the Centre des ŒuvresUniversitaires of the University of Kara.

Anti-HBc antibody and viral load

Total anti-HBc antibodies were tested by Elisa technique on a MAGLUMI 600® machine, Snibe Co. Ltd, China. The viral load was performed by real-time amplification technique on the Cobas Ampliprep Roche ® automated system. For this purpose, the students were called and the samples were transported to the laboratory of the University Hospital of Kara.

Ethical considerations

The results were presented to each student in complete confidentiality followed by counseling. Positive cases were follow-up and referred the vaccination sites for appropriate management.

RESULTS

A total of 600 students were screened for HBsAg during their first enrollment at the University of Kara. A prevalence of 15% (n= 92) was found. Of the 92 students, only 54 agreed to continue the study. The sex ratio (M/F) was 3.15. Their age was ranged from 19 to 26 and the median was 21.6. Students aged 20 and 21 years were the most represented, the first were 24% (n=13) and second 31.5% (n=17). None of the students were symptomatic and all had total anti-Hbc antibodies (Table I).

Hepatitis C and retroviral serology

The prevalence of HCV and HIV was each 5.5% (n=3). One student carried all three viruses.

HBV viral load

Among the 54 students, Hepatitis B Virus was detected in 79.6% (n=43). Of these, 9.3% (n=4) had a viral load at the limit of detection (<10 IU/ml). Most of them, 69.8% (n=30) had a viral load between 10 and 2000 IU/ml; 16.3% (n=7) had a viral load higher than 20,000 IU/ml. (Figure 1)

Biochemical assessment

Alanine Amino Transferase in all women was normal. It was elevated in 17% (n=7) of our male patients. Among them, five had a viral load higher than 20,000 IU/ml. Elevation of aspartate amino transferase was noted in 11% (n=6) of students. This elevation was always accompanied by the elevation of ALT. Elevation of various transaminases associated with alkaline phosphatases was noted in 2 students with a viral load greater than 20,000 IU/ml.
No elevation of GGT and creatinine was noted during the study.

Abdominal ultrasound

That was performed in 30 students, the rest have not honored their convocation. The liver had a homogeneous echostructure in all students. Splenomegaly was found in 17% (n=5). Among the latter, no co-infection was noted. The HBV viral load was quite high in two patients: 3050 IU/ml and 517000 IU/ml.

DISCUSSION

The prevalence of Hepatitis B among students enrolled in their first year at the University of Kara is 15%. This prevalence is quite high compared to the surrounding countries: 6% in Benin during a screening in the general population (5), 8% in Ghana (6), 8.8% in Burkina Faso (7) and 12% in Ivory Coast (8). However, similar prevalences have been found in distinct studies carried out in Lomé (3,4). Our result, collected in the second city in Togo strongly indicates that the prevalence of HBV is high in Togo. Importantly, this confirms the

WHO classification where Togo is a high HBV prevalence country (9). Nevertheless, whole-country studies are needed to accurately assess the national prevalence of viral hepatitis B.

Anti-HBc antibodies are signs of contact with the hepatitis B virus. In our study, all students had total anti-HBc antibodies. Indeed, a study conducted among blood donors in Lomé noted a prevalence of anti-HBc antibodies of 53%. This shows that the virus is circulating in the Togolese population and therefore almost half of the individuals have already had an episode of viral hepatitis B (10). This rate is similar to that found in Cameroon among blood donors, 57%(11). During our study, we did not perform IgM and IgG antibody assays, which would have indicated whether the infection was recent or chronic. However, clinically, none of the students showed signs of acute hepatitis during the study. Also, the biology did not show a significant elevation of transaminases. In sub-Saharan Africa, the most important mode of HBV infection is vertical transmission from mother to child from birth and in early childhood (12). As a result, the majority of patients are infected at an early age with a progression to chronicity.

Hepatitis B, C and HIV viruses are considered as STIs and share the same transmission routes. The study population is mostly young and in the sexually active age group. The seroprevalence of hepatitis C and HIV among HBsAg positive students in our study was 5.5%. A similar prevalence was found among drug users in Tanzania, 3.5%(13). A similar study conducted in 2015 among students at the University of Lomé in Togo, showed an HIV prevalence of 0.8% among HBsAg positive students (14). This prevalence is lower than that found in our study. This indicates a certain lack of awareness of these viruses in the north of the country, which favors contamination. Indeed, the population of Kara is mostly rural and targeted actions should be carried out in order to avoid new contaminations. The seroprevalence of HCV is approximately equal to that found among sex workers in Togo in 2017. This study already showed that the prevalence was higher as soon as one left the city of Lomé (15). In all studies conducted in Togo or elsewhere in the West African region, HCV prevalence remains the lowest among these three viruses (4,16-18).

HBV viral load was detected in 79% of the students screened. Among these students, mild splenomegaly was identified by abdominal ultrasound in 5 patients, two of whom had a high viral load. It should be noted that these students did not know their serological status. Indeed, biomedical analyses are rarely performed and the rural population, due to limited financial means, resorts either to self-medication or to traditional medicine. Approximately 13% had a viral load of more than 20,000 IU/ml, some of which were associated with an elevated ALT level. These students are therefore in an active phase of the disease with a risk of developing later complications such as cirrhosis and hepatocellular carcinoma. The patients with elevated ALT were all male. Male gender, cytolysis and high viral load are risk factors for the development of hepatocellular carcinoma related to viral hepatitis B (12). These patients should be promptly identified and started on treatment to avoid these fatal complications. Only one person among them had liver lesions on ultrasound. Most of the students screened were in the active replication phase suggesting a high risk of transmission of the infection. Moreover, the average age of these students being 21 years old, this suggests a probable intranatal or perinatal contamination in view of the clinic which is not very suggestive.

CONCLUSION

The prevalence of viral hepatitis B is high in the student population of the University of Kara. The observed immune tolerance is a sign of contamination for most of them in childhood. Awareness and screening sessions should be implemented for the university population in order to decrease the rate of new infections. Whole-country screening and study about relationship between hepatocarcinoma and HBV infection are required to obtain a longitudinal understanding of the long-term health consequences of the high prevalence of HBV on the health of those affected and the incidence of cancer rates in the population.

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