

Evaluation of HBsAg seroprevalence in patients seen in consultation at the University Hospital of Abéché-Chad

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Abstract

Introduction: Hepatitis B is a serious viral infection of the liver caused by the hepatitis B virus (HBV). This infection leads to inflammation of the liver, which can become chronic and result in liver cirrhosis and hepatocellular carcinoma.

Objective: To determine the seroprevalence of HBsAg in patients at the Abéché University Hospital in Chad.

Material and Methods: This was a prospective cross-sectional study conducted from April 1, 2022, to December 31, 2022, on a total of 845 patients aged 15 to 60 years seen in consultation at the Abéché University Hospital. HBsAg detection was performed using chromatography, and confirmation was carried out using the immunoassay method (ELISA).

Results: The analysis showed that among the 845 patients tested, 112 were positive for HBsAg, representing an overall prevalence of 13.3% (112/845). Males represented 50.9% (430/845), while females represented 49.1% (415/845); the sex ratio was 1.03. The most affected age groups were 26–35 years (34.82% = 39/112), followed by 15–25 years (25.89% = 29/112). By occupation, farmers/livestock breeders were the most represented (61/112 = 54.46%), followed by homemakers (20.53% = 23/112). By marital status, married individuals were more affected (58.93% = 66/112) than single individuals (41.07% = 46/112).

Conclusion: The seroprevalence of hepatitis B virus was relatively high in the population of Abéché, with more pronounced predominance among young people, married individuals, and particularly those working in agriculture and livestock farming. Combating the spread of this endemic infection in Chad requires strengthened strategies, including vaccination, targeted screening, and public awareness campaigns.

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Keywords: Seroprevalence; HBsAg; Associated factors; Abéché University Hospital; Chad

1. Introduction

Viral hepatitis B is a liver disease characterized by inflammation and is a public health problem. It is caused by the hepatitis B virus (HBV). According to the World Health Organization (WHO), the number of people living with chronic hepatitis B worldwide is estimated at 254 million [1,2]. Each year, approximately 1.2 million new infections and 1.3 million deaths, primarily related to hepatocellular carcinoma (HCC) and cirrhosis, are recorded [1].

The burden of infection is highest in the Western Pacific Region and the African Region, where 97 million and 65 million people respectively have chronic infection. There are 61 million infected people in the South-East Asia Region, 15 million in the Eastern Mediterranean Region, 11 million in the European Region, and 5 million in the Region of the Americas [1].

In 2024, the Cameroonian Ministry of Health reported an overall prevalence of 11.2% of hepatitis B infection [3]. This high prevalence is attributed to parenteral and perinatal transmission. In Nigeria, the prevalence of hepatitis B virus infection was 12.2% [4].

In 2019, Makanéra et al. reported a HBV seroprevalence of 17.9% at the Sino-Guinean Friendship Hospital in Conakry [5]. Furthermore, in 2024, Makanéra et al. reported a HBV carriage seroprevalence of 14.8% in a study conducted at the same hospital [6]. Another study by Camara et al., conducted in several health facilities in Conakry, revealed a HBV infection prevalence of 14% [7].

In Chad, studies have shown HBsAg seroprevalence rates of 12.8% and 15.76%, respectively [8,9].

In the province of Abéché, little data is available on HBV seroprevalence, despite the presence of high risk factors and limited access to screening and vaccination. This lack of data hinders prevention and management strategies.

Hence the choice of evaluating HBV seroprevalence in patients seen in consultation at the University Hospital of Abéché (Chad) in order to update scientific data on the prevalence of HBV infection in this province and to contribute to the improvement of interventions to combat hepatitis B. The objective of this work was to determine the risk factors associated with HBsAg seroprevalence in patients seen in consultation at the University Hospital of Abéché.

2. Material and methods

2.1. Methodology

Study Design: This was a prospective cross-sectional study conducted from April 1, 2022, to December 31, 2022. The University Hospital Center of Abéché, Chad, located in the city of Abéché and under the supervision of the Ministry of Public Health, with a mission of research, training, and healthcare, served as the setting for this study. The study included 845 patients seen in consultation at the University Hospital Center of Abéché, ranging in age from 15 to 60 years, who voluntarily agreed to participate.

2.2. Data Collection and Laboratory Analysis Procedures

After obtaining informed consent, a questionnaire developed using Kobocollect was used. The data collected concerned socio-professional characteristics, including age, sex, and occupation. For the analysis of serum samples, an immune-chromatographic test (RDT) was used to detect the hepatitis B surface antigen (HBsAg). Positive cases were confirmed by the enzyme-linked immunosorbent assay (ELISA).

3. Results

3.1. Socio-demographic characteristics of patients

The analysis of socio-demographic characteristics without taking into account seroprevalence shows the following statistics (Table 1). A total of 845 patients seen in consultation at the Abéché University Hospital were included in the study. The participants consisted of 430 men (50.9%) and 415 women (49.1%), for a sex ratio (Male/Female) of 1.03. This indicates a very low male predominance. The age of the population ranged from 15 to 60 years. The mean age was

30 years. Individuals in the 26-35 age group were the most represented (38.1%), followed by those aged 15-25 (37%). Patients aged 36–45 and 46–60 years represented 13.6% and 11.2%, respectively. Majority of the patients were married (61.4%). Housewives (38.9%) and farmers/livestock breeders (34.4%) were the most represented groups, followed by students (17.3%). In contrast, teachers, civil servants, and manual laborers each represented less than 5%. The majority of participants had no knowledge of hepatitis B. Only 19.5% of patients knew of or had learned of a hepatitis B virus infection (Table 1).

Table 1 Distribution of patients studied according to their socio-demographic and professional characteristics.

Characteristics	Number N = 845	Percentage
Sex		
Female	415	49.1
Male	430	50.9
Age (years)		
15 – 25	313	37.0
26 – 35	322	38.1
36 – 45	115	13.6
46 – 60	95	11.2
Marital status		
Singles	326	38.6
Married	519	61.4
Profession		
Housewives	329	38.93
Merchants	49	5.80
Farmers/livestock breeders	291	34.43
Students	146	17.28
Teachers	7	0.83
Civil servants	18	2.13
Workers	5	0.59
Knowledge of hepatitis B		
No	680	80.47
Yes	165	19.53

However, Table 2 shows the results of the overall seroprevalence of HBsAg in the general population but also in different groups (sex, age, marital status)

Table 2 Seroprevalence of HBsAg of the hepatitis B virus according to the socio-demographic characteristics of patients.

Characteristics	Number (N=845)	positive cases : n/112 (=%)
Global seroprevalence	845	112/845(=13.25%)
Sex		
Female	415	28/112 (=25%)

Male	430	84/112 (=75%)
Age (years)		
15 - 25	312	29/112(=25.89%)
26 - 35	283	39/112 (=34.82)
36 - 45	95	20/112 (=17.86%)
46 - 60	71	24/112 (=21.43%)
Marital status		
Singles	280	46/112 (=41.07%)
Married	543	66/112 (=58.93%)
Professions		
Housewives	329	23/112 (=20.53%)
Merchants	49	7/112 (=6.25%)
Farmers/livestock breeders	291	61/112 (=54.46%)
Students	146	12/112 (=10.71%)
Teachers	7	1/112 (=0.89%)
Civil servants	19	7/112 (=6.25%)
Workers	5	1/112 (=0.89%)
Knowledge of hepatitis B		
Yes	165	17/112=15,18%
No	680	95/112=84,82%

4. Discussion

This study revealed an overall HBsAg seroprevalence of 13.3% among patients seen in consultation (Table 2). This result reflects a high endemicity of the hepatitis B virus in the studied area. These results are consistent with estimates from the World Health Organization, which report a prevalence between 8% and 15% in several sub-Saharan African countries [10]. Moreover, several regional studies have reported similar rates, notably in Cameroon in 2017 and 2023 where similar prevalences of (11.2%) were found, in Sudan (12.07%) and in Chad a prevalence of 14.87% of HBV infection among students in N'Djamena confirming the persistence of significant HBV circulation in the region [11-14]. Analysis of HBsAg seroprevalence in the population shows a significant difference between the two sexes (Table 2). Indeed, males were far more frequently affected by hepatitis B virus infection, as the prevalence of HBsAg in males was higher (75% = 84/112) than in females (25% = 28/112). These results are close to those reported in N'Djamena (Chad) in 2024 by Debsikréo et al. (2024), who found an HBsAg prevalence of 76.14% in males versus 23.85% [14]. Our results are similar to those reported in Central african Republic by Basimane-Bisimwa et al. (2024), Moussa et al. (2022) in Chad and Touré et al. (2021) in Senegal [9,14-16]. The same observation was made in Mali in 2018 by Katilé et al. (2018) [17] and in Burkina Faso by Meda et al. (2018) [19]. However, these results are diametrically opposed to those reported in 2025 by Camara et al. (2025) who found, in their study conducted in the city of Conakry, a higher prevalence of HBsAg carriage in females than in males, with 69% and 31% respectively [7]. Similarly, Funch et al (2022) found in their study in Cameroon that women were in the majority with 59.6% [20].

This could be explained by a cultural difference between the two countries. However, it should be emphasized that the high prevalence of HBsAg in the present study in males than in females would be consistent with data from the literature and would be explained by the theory of low HBsAg clearance in men [8,9,14-17]. On the other hand, this disparity could be explained by men's more frequent exposure through risky behaviors (unprotected sexual intercourse, scarification, use of non-sterile sharp or piercing materials), as well as immune-biological differences that may influence viral clearance [15,18]. The analysis of socio-demographic characteristics without taking into account seoprevalence shows the following statistics (Table 1). The 26-35 age group (38.1% = 322/845) was predominant, followed by the 15-25 age group (37% = 313/845). The breakdown by occupation showed that housewives were the most represented (38.93%

= 329/845), followed by farmers/livestock breeders (34.43% = 291/845) and students (17.28% = 146/845). According to marital status, married individuals were in the majority (61.42% = 519/845) compared to 38.58% (326/845) who were single (Table 1).

However, Table 2 shows the results of the overall seroprevalence of HBsAg in the general population but also in different groups (sex, age, marital status). Analysis of HBsAg seroprevalence (Table 2) by age showed that the 26-35 age group was predominant (34.82% = 39/112), followed by the 15-25 age group (25.89% = 29/112). These two age groups accounted for more than 60% of individuals infected with the hepatitis B virus. Indeed, these two groups correspond to those with more intense and frequent sexual activity. These results corroborate those reported in a similar study conducted in Burkina Faso (Meda et al. 2018) [19]. In Africa, the situation is dramatic as the disease affects young people much more frequently [8]. The association between age and seroprevalence does not indicate a progressive and cumulative increase in seropositivity with age, as seen in other studies. Indeed, some studies in the literature seem to reflect cumulative exposure to HBV over the years and the persistence of chronic cases in individuals infected early in life. Comparable results have been reported in Cameroon, Burkina Faso and Ethiopia, where seropositivity rates were higher among adults over 30 years of age [19-21].

No significant relationship was observed between HBsAg seroprevalence and marital status. This finding is consistent with observations made in Senegal by Sene et al., (2025) and Burkina Faso Nikiema et al., (2025), suggesting that marital status is not a direct determinant of HBV transmission, although it may be indirectly influenced by sexual behaviors and healthcare practices [22, 23].

Seroprevalence varied significantly according to occupation. Farmers/livestock breeders and homemakers had the highest rates (54.46%) and (20.53%), respectively, followed by students (10.71%). Tradespeople and civil servants had similar rates (6.25%). The high rates among farmers / livestock breeders and homemakers are likely directly related to illiteracy in these two occupational categories, as well as a lack of information about hepatitis B vaccination.

This disparity could also be explained by different levels of exposure, linked to risky practices, access to care, and vaccination coverage. Similar results have been reported in Guinea, showing a high prevalence among housewives followed by farmers (Makanéra et al. 2024) [6].

The lack of association between knowledge of hepatitis B and seroprevalence ($p = 0.26$) suggests that information alone is insufficient to change risky behaviors. A study conducted in 2022 in Gambia by Jarju et al., (2022) showed low knowledge among the studied population, as well as the fact that positive individuals were often not tested [24]. Another study in Malaysia reported by Ahmad et al. (2016), showed that attitudes and practices related to hepatitis B were associated with knowledge [25]. These results indicate the need for more targeted health education programs that combine awareness-raising, vaccination, and access to testing.

The high prevalence observed in this study underscores the need to strengthen national strategies for the prevention and control of HBV. This includes routine vaccination at birth, targeted screening of at-risk groups, promotion of safe medical practices, and community education. These actions are consistent with the World Health Organization's strategy to eliminate viral hepatitis B as a public health threat by 2030 (WHO, 2023) [10].

The study's strength lies in its use of data collected from a population receiving consultations at a referral hospital, a first in the Ouaddai province. However, certain limitations must be considered when interpreting the results, such as the lack of PCR testing for confirmation and viral load.

5. Conclusion

This study highlights the high prevalence of HBsAg in the population of Abéché, Ouaddai Province (Chad), confirming the circulation of Hepatitis B in this city. It represents the first study of its kind in this province of Chad. These important epidemiological data contribute to a better understanding of the dynamics of Hepatitis B in a highly endemic context. All of these results underscore the need to strengthen epidemiological surveillance strategies, including vaccination from birth, early detection, and awareness campaigns for at-risk populations, thereby contributing to reducing the transmission and morbidity associated with Hepatitis B.

Compliance with ethical standards

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Disclosure of conflict of interest

The authors declare no conflicts of interest.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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