

Prevalence of Viral Hepatitis B among Women of Childbearing Age in the Kara Region of Togo in 2022

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Abstract

Introduction: The hepatitis B virus (HBV) is one of the major causes of morbidity and mortality in the world. Few up-to-date data on this disease are available in developing countries, including Togo. The aim of this study was to estimate the prevalence of hepatitis B among women of childbearing age in the Kara region of Togo. **Methods:** A cross-sectional study was carried out from 23 to 25 September 2022 during a fairground campaign. Data were collected using a standardised questionnaire. HBV screening was performed using “SD-BIOLINE HBsAg WB” rapid immunochromatographic tests. HBV prevalence was reported with its 95% confidence interval (CI). Regression analyses were performed to identify factors associated with HBV infection. **Results:** A total of 327 women were enrolled, with a median age of 34 years and an interquartile range of [25 - 43]. Nearly half (49.5%) of the women had had their first sexual intercourse before the age of 18 and 2.1% had at least 2 sexual partners at the time of the survey. The majority (91.7%) had not used a condom the last time they had sex. The prevalence of hepatitis B was 10.4% (95% CI: 7.5 - 14.2]). In multivariable analysis, having had sexual intercourse for the first time after the age of 18 (ORa = 0.17; 95% CI [0.06 - 0.43]; p < 0.001), and secondary (ORa = 0.24; 95% CI [0.09 - 0.61]; p = 0.003) or university education (ORa = 0.25; 95% CI [0.77 - 0.86]; p = 0.028) were protec-

tive factors against HBV infection compared with those who had primary education or had never attended school. **Conclusion:** The results of this study underline the importance of monitoring the prevalence of hepatitis B in women of childbearing age, and of implementing targeted prevention and screening measures to eliminate mother-to-child transmission of HBV.

Keywords

Hepatitis B Virus, Women of Childbearing Age, Togo

1. Introduction

Hepatitis B is an infectious liver disease characterised by hepatocellular necrosis and caused by a virus belonging to the Hepadnaviridae family [1]. Infection with the hepatitis B virus (HBV) remains a major cause of acute and chronic liver disease, with significant morbidity and mortality worldwide [2]. The risk of chronic infection following exposure to HBV depends on age at the time of infection, with a 90% risk when infection occurs in early childhood and a risk of less than 10% when infection occurs in immunocompetent adolescents and adults [3]. In 2021, the World Health Organisation (WHO) estimates that around 240 million people worldwide will be infected with the hepatitis B virus [4], but only 11% of people living with viral hepatitis know their serological status [5]. HBV infection is more widespread than other types of hepatitis, with 1.5 million new infections each year and 887,000 deaths due to chronic HBV infection [2]. Sub-Saharan Africa is one of the most endemic regions in Africa, with hepatitis B prevalence estimated at around 8% [6]. The prevalence of HBV is particularly high in regions where HIV is endemic [7] [8]. Hepatitis B is a viral infection that can be transmitted sexually, making it a sexually transmitted infection (STI) [9]. In women, hepatitis B is a health problem because of its implications for reproductive and general health [9]. HBV infection in women presents specific risks, in particular vertical transmission from mother to child during pregnancy or childbirth [10]. Transmission of HBV in women occurs mainly through direct contact with the blood or semen of an infected person [11]. Risky behaviour such as unprotected sex and sharing contaminated needles or objects also increase the risk of infection with the hepatitis B virus [12]. Preventing hepatitis B in women is based on essential measures such as promoting the use of condoms during sexual relations, early screening to ensure that infected women receive appropriate care, and vaccination against hepatitis B [11]. In view of the consequences of HBV infection, Togo's public health authorities have been gradually introducing measures to prevent hepatitis B since 2008, with the introduction of the hepatitis B vaccine as part of the Expanded Programme on Immunisation (EPI) [13]. In Togo and the Kara region, few studies of the prevalence of hepatitis B in women of childbearing age have been carried out [14] [15].

A study carried out in 2016 in Lomé among the general population showed

that belonging to the Kabyè ethnic group (population of the Kara region) was a risk factor associated with the carriage of HBsAg [14]. The lack of up-to-date data on the prevalence of hepatitis B means that we have no real idea of the epidemiological situation, which could guide public health actions (prevention, screening and treatment) and thus help to reduce the transmission and control of this disease. In order to obtain factual, up-to-date data on hepatitis B, we conducted this study with the aim of estimating the prevalence of hepatitis B and describing its associated factors among women of childbearing age in the Kara region of Togo in 2022.

2. Methods

2.1. Study Design and Period

A descriptive and analytical cross-sectional study was carried out from 23 to 25 September 2022 in the Kara region in northern Togo, 420 km from Lomé, the capital of Togo.

2.2. Study Population

The study population consisted of women of childbearing age in the Kara region. The eligibility criteria included: 1) being between the ages of 18 and 45, 2) having resided in the Kara region in the 12 months leading up to the survey, and 3) providing oral consent for enrollment in the study.

Given the context of a fairground campaign, an accidental non-probability sampling method was used to recruit the women.

2.3. Sample Size

The number of subjects required was calculated on the basis of estimates of the prevalence of HBsAg infection among women in Togo, estimated at 10% [15]. For this estimate to be accurate to 1%, *i.e.*, a 95% confidence interval for HBsAg prevalence of between 8% and 12%, at least 384 subjects would need to be included.

2.4. Data Collection

The data was collected using a standardised questionnaire. The questionnaire was developed by an epidemiologist and a biologist and administered face-to-face by nurses who had been trained beforehand.

The average time taken to complete the questionnaire was five minutes. The questionnaire included items on socio-demographic characteristics, sexuality, gynaeco-obstetric history and condom use.

The questionnaire was pre-tested with 10 women to reformulate questions that were difficult to understand. The women who took part in the pre-test did not take part in the final survey.

2.5. Study Procedures

A fairground campaign was organised by the Kara Regional Health Department. A space was set up to welcome the participants and to carry out the hepatitis B

counselling and screening activities effectively. Only volunteers were enrolled in the study.

2.6. Hepatitis B Screening (HBsAg)

On-site screening for hepatitis B was carried out by laboratory technicians who had been trained beforehand. Capillary blood samples were taken from the fingertips and tested using the “SD-BIOLINE HBsAg WB” rapid immunochromatographic tests. Pre- and post-test advice on the hepatitis B virus was given, and the serological status was communicated to the participants 2 to 3 hours after the sample was taken. Once the results were available, the healthcare professionals explained the results to the participants. In the event of a positive result, appropriate medical advice was provided, and those concerned were referred to healthcare facilities for full medical follow-up and treatment if necessary. In the event of a negative result, participants were urged to take preventive measures such as vaccination (after additional tests had been carried out, including hepatitis B markers) and the use of safe sex practices to avoid future exposure to the hepatitis B virus.

2.7. Statistical Analysis

After collection, the data was entered and saved on a database developed using EPIData (French version 3.1). The data were analysed using R © version 4.2.1 software. Quantitative variables were presented as medians with their interquartile ranges (IQR), and categorical variables were presented as numbers and proportions. The prevalence of hepatitis B was estimated with its 95% confidence interval. Univariate and multivariate logistic regression analyses were performed to identify factors associated with HBV infection. The significance threshold for statistical tests was set at 5%.

2.8. Ethical Considerations

This study received favourable opinions from the Bioethics Committee for Health Research (opinion number 02/2022/CBRS dated 18 January 2022) and from the Regional Director of Health in Kara. The objectives of the study were explained to the participants. They were informed that their participation was voluntary and that they were free, without justification, to withdraw at any time without any negative consequences for them. They were given the necessary time to reflect before deciding whether or not to take part in the study. Verbal consent was obtained from each participant prior to inclusion. The confidentiality of the data collected was guaranteed by using a unique identifier.

3. Results

3.1. Socio-Demographic Characteristics

A total of 327 women with a median age of 34 years, IIQ [25 - 43] were enrolled. The majority (89.0%) were married and only 19.3% had a university education.

The socio-demographic characteristics of the participants are summarised in **Table 1**.

3.2. Sexuality. Gynaeco-Obstetrical History and Condom Use

Almost half (49.5%) of the women had had their first sexual intercourse before the age of 18 and 2.1% had had 2 or more sexual partners at the time of the survey.

The majority (91.7%) had not used a condom the last time they had sex.

Table 2 describes sexuality. Participants' obstetric history and condom use at last intercourse.

3.3. Prévalence

The prevalence of hepatitis B was 10.4% (95% CI: [7.5 - 14.2]).

3.4. Factors Associated with Viral Hepatitis B Infection

In multivariable analysis, having had sexual intercourse for the first time after the age of 18 (ORa = 0.17; 95% CI [0.06 - 0.43]; $p < 0.001$) and a secondary (ORa = 0.24; 95% CI [0.09 - 0.61]; $p = 0.003$) or university (ORa = 0.25; 95% CI [0.77 - 0.86]; $p = 0.028$) level of education were protective factors against HBV infection.

The factors associated with viral hepatitis B infection are summarised in **Table 3**.

Table 1. Socio-demographic characteristics of participants (n = 327).

Variables	n	Proportion (%)
Age (years)		
Median [IIQ]		34 [25 - 43]
Age groups (years)		
[18 - 25]	92	28.1
]25 - 45]	235	71.9
Level of education		
Primary	82	25.1
Secondary	182	55.6
Higher	63	19.3
Marital status		
Not married	36	11.0
Married	291	89.0
Residence		
Rural	11	3.4
Urban	316	96.6

Table 2. Sexuality, obstetrical history and condom use among participants (n = 327).

Variables	n	Proportion (%)
Have already had sexual intercourse		
No	4	1.2
Yes	323	98.8
Age at first sexual intercourse (n = 323)		
<18 years	162	49.5
≥18 years	161	49.3
Current sex partner		
<2	320	97.9
≥2	7	2.1
Number of previous pregnancies		
<1	141	43.1
≥1	186	56.9
Number of previous births		
<1	28	8.6
≥1	299	91.4
Used a condom the last time you had sex		
No	300	91.7
Yes	27	8.3

Table 3. Factors associated with viral hepatitis B infection in women of childbearing age in the Kara region of Togo, 2022 (N = 323).

Caractéristique	n/N	Univariate model			Multivariate model		
		OR ¹	95% CI ¹	p	ORa ¹	95% CI ¹	p
Age groups (years)							
<30	16/102	1			1		
≥30	18/205	0.61	0.30 - 1.25	0.181	0.64	0.29 - 1.41	0.274
Level of education							
Primary	13/81	1			1		
Secondary	16/180	0.51	0.23 - 1.11	0.093	0.24	0.09 - 0.61	0.003
Higher	5/62	0.45	0.15 - 1.36	0.161	0.25	0.77 - 0.86	0.028
Age at first sexual intercourse							
18	26/162	1			1		
≥19	8/153	0.27	0.11 - 0.62	0.002	0.17	0.06 - 0.43	< 0.001
Used a condom the last time you had sex							
No	33/300	1			1		
Yes	1/23	0.36	0.47 - 2.81	0.336	0.28	0.03 - 2.63	0.269
Number of previous births							
No	3/23	1			1		
Yes	31/300	0.76	0.21 - 2.73	0.684	0.56	0.12 - 2.53	0.455

¹OR = Odds Ratio; 95% CI: 95% confidence interval; ¹ORa = adjusted Odds Ratio.

4. Discussion

This study, conducted in September 2022, showed that the prevalence of hepatitis B among women of childbearing age in the Kara region of Togo was 10.4%. Having sexual intercourse for the first time after the age of 18 (ORa = 0.17) and having secondary (ORa = 0.24) or university (ORa = 0.25) education were protective factors against HBV infection.

Our study found a prevalence of hepatitis B of 10.4% among women of childbearing age in the Kara region. Similar prevalences of 10.6% and 9.9% were reported in 2020 and 2021 respectively in the general population and among sex workers. In the literature, lower prevalences, 6.0% [16], 6.4% [17], and 4.6% [18] have been reported respectively among pregnant women in 2022 in Ghana, in 2021 in Nigeria and in 2015 in Togo. However, our result is slightly lower than those found in 2017 among women mothers, 15% [15] and in 2010 among young people (aged 15 to 24) 23.1% [19] in the same region. Comparisons of the results of our study with those of other studies should therefore be made with caution, taking into account not only the country, the area and the target population, but also the years in which the study was carried out.

Our study also showed that having sexual intercourse for the first time after the age of 18 (ORa = 0.17; 95% CI [0.06 - 0.43]; $p < 0.001$), secondary education (ORa = 0.24; 95% CI [0.09 - 0.61]; $p = 0.003$) or university education (ORa = 0.25; 95% CI [0.77 - 0.86]; $p = 0.028$) were protective factors against HBV infection.

In 2019, a study carried out in China among migrant workers revealed that younger individuals with a lower level of education were more likely to adopt risky behaviours exposing them to infection by the hepatitis B virus [20]. Another study carried out in 2021 in Cameroon among pregnant women revealed that those with no education were 1.6 times more likely to be infected with HBV than those with some education [21].

The age of first sexual intercourse is an important determinant of transmission of hepatitis B infection. Young women who have had their first sexual intercourse at an early age are more likely to be exposed to risky sexual behaviour and to a greater number of sexual partners [22]. Risky sexual behaviour, particularly in adolescents and young adults, may lead to higher transmission of hepatitis B in this population [22].

Older age at first sexual intercourse is a potential protective factor against HBV infection, due to the acquisition of knowledge and safer behaviour over time. Women with a higher level of education also tend to be more aware of the risks associated with hepatitis B and of preventive measures such as vaccination. They are also more likely to adopt safer behaviours, such as using condoms during sex.

All these arguments could justify the fact that our study reveals that an acceptable level of education is a protective factor against HBV infection. Our results underline the importance of increasing awareness among the target group studied of risky sexual practices and the need to use prevention methods, such as

the systematic use of condoms, to reduce the risk of hepatitis B transmission. Our study also provides up-to-date evidence on the prevalence of hepatitis B among women of childbearing age in the Kara region.

The study also has a number of limitations. A selection bias cannot be ruled out given the recruitment method, with a strong possibility that women with health problems would take part in this screening campaign. This could have overestimated the prevalence found. Memory bias and social desirability bias are also possible in terms of age at first sexual intercourse and number of sexual partners.

5. Conclusion

Our study showed a prevalence of HBV of 10.4% among women of childbearing age in the Kara region. These results indicate that hepatitis B remains a major public health concern among women of childbearing age. Preventive measures such as awareness-raising and systematic screening of women of childbearing age could help to reduce the incidence and prevalence of HBV in this population. Screening should also be made free of charge, as it is for HIV, as the current cost of between €3 and €5 can be a significant barrier for many women. In addition, free screening would make it easier to identify carriers of the virus and to introduce effective antiviral treatment to limit transmission of the disease, particularly from mother to child. Not only would this measure be an essential act of prevention for public health, but it would also help to reduce the economic burden associated with long-term medical care for hepatitis B patients. Setting up a register will also make it easier to keep track of people who are already infected.

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Authors' Contributions

DKE, FAG and GYSG conceived this study and participated in its design and coordination. GYSG, AJS, YRK, FBTD and WICZ participated in the study design and data collection. GYSG, MKT, DKE, SA performed statistical analyses. GYSG, DKE, FBTD, SA, and AJS wrote the first draft of the manuscript and DKE, GYSG, LKA, MKT, AJS, FBTD, YRK, AA, WICZ, FAG subsequently revised the manuscript. All authors read and approved the final manuscript.

Conflicts of Interest

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

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