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RESEARCH ARTICLE

EPIDEMIOLOGY AND PREVALENCE OF HBS AG IN PREGNANT WOMEN ADMITTED FOR CONSULTATION AT THE SAABOU HEALTH CENTER, URBANCOMMUNE OF MAMOU (REPUBLIC OF GUINEA)

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ABSTRACT

Hepatitis B is a viral infection that attacks the liver; its virus persists in the environment for more than7 days. It is present in all biological fluids of infected subjects, mainly blood. Its main modes of transmission are: sexual, parenteral, maternal -fetal and horizontal transmission. This constitutes a public health problem. This is a prospective and descriptive study of an analytical type. It took place from September 1 to November 30, 2023. ***Objective:*** Determining the prevalence of HBsAg within the population of pregnant women admitted for consultation at the Saabou Health Center is the main objective of this study. ***Method:*** The Aichek -type chromatographic immune test technique for the detection of hepatitis B virus (HBV) surface antigen in serum is used. ***Results:*** Out of a total of 215 pregnant women tested, 7 were HBV positive, or 3.25%, compared to 208 HBV negative cases, or 96.75%. The 34-42 age group presents 4 positive HBV cases, or 57.14%. Brides, who are not only the most represented in the samples, are also the most affected by HBV with 5 positive cases, or 71.42%. Compared to the professional case, housewives were the most affected with 57.14%. ***Conclusion:*** this infectious disease is gaining ground; we must act at all levels to put an end to it. This study is part of an investigation campaign into the circulation of HBV among pregnant women in the Mamou prefecture.

INTRODUCTION

Viral hepatitis B constitutes an international public health problem due to its frequency, its complications and its socio- economic consequences, comparable to that posed by other major communicable diseases such as HIV, tuberculosis or malaria. Sub-Saharan Africa, with a prevalence rate of between8% and 18%, constitutes an area of high endemicity (1). The majority of chronic hepatitis B virus infections are contracted at birth through so-called "vertical" transmission. This involves the transmission of the hepatitis B virus from mother to child during delivery, secondary to mother-child microtransfusions during contractions and contact with infected vaginal secretions. The risk is very high because infected children become chronic carriers of the B virus in90% of cases.

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It has therefore been recommended since 1992 in France to systematically screen all pregnant women for the presence of HBs antigen (HBsAg) during the sixth month (2). If the response is not expanded and accelerated, forecasts show that the number of people with hepatitis B will be high over the next 40 to 50 years and the total number of deaths between 2015 and 2030 will be 20 million (3). The World Health Organization (WHO) estimates that more than 2 billion people have been infected with hepatitis B during their lifetime, or approximately 30% of the world's population. The hepatitis B virus (HBV) is 50 to 100 times more contaminating than HIV. Among the patient population worldwide, 360 million (or 5%) suffer from chronic infections, mainly on the Asian and African continents. More than a million of them die each year from complications linked to this infection, particularly liver cirrhosis and hepatocellular carcinoma. HBV is the second known human carcinogen after tobacco (4). In France, a survey carried out by the National Health Monitoring Institute (INVS) from a sample of Socially Insured people under the general Social Security system between 2003 and 2004 reported a rate

of chronic HBV carriage estimated at 5, 25% among people from sub-Saharan Africa and 0.92% among people from Asia compared to 0.68% in the general population. Also, it was noted that only 45% of HBsAg carriers know their serological status, which leads to a delay in treatment and increases the risk of transmission of the disease (5). In Madagascar, the country has a rate of 23% of people suffering from hepatitis B, it is one of the highest in Africa (6). In Ivory Coast, the prevalence is 9% (7).In Mauritania, the prevalence varies between 16 to 25% (8).This prevalence is 8.06% in Niger (9). The prevalence of HBV in Mali is 14.7% (10). In Tunisia, it is 6% (11). In the Republic of Guinea as in other countries, the majority of the population does not have sufficient information on the existence and circulation of HBV within it and yet the development and spread of this virus constitutes a real health problem. public health which affects all age groups, gender and all socio-professional strata.

MATERIALS AND METHODS

Study environment and setting: this study was carried out at the Saabou Health Center in the Urban Commune of Mamou. THE laboratory of medical biology of the Institute Superior of Technology of Mamou has served of frame study for the realization of present work. The Mamou Higher Institute of Technology is a public professional institution, reporting to the Ministry of Higher Education, Scientific Research and Innovation. It was created by decree No. 2004/9245/MESRS/CAB of August 25, 2004 as part of the decentralization of Higher Education Institutions (IES) of the Republic of Guinea. Since its creation, it has had six (6) departments including that of Laboratory Techniques.

Work materials: to carry out this work, we used the following equipment: electric centrifuge, Aichek chromatographic immune test strip, stopwatch, pasteur pipettes, hydrophilic cottons, latex gloves, 5cc syringes, hemolysis tubes, boxes of security, trash cans.

Working method: this is a prospective and descriptive longitudinal study which took place from September 1 ^{to} November 30, 2023. Pregnant women admitted to the Saabou Health Center were our target population. Were included in this study, all pregnant women received at the Saabou Health Center and who have accepted to submit to our investigation. Sampling has summer random simple and the sample size was n = 215 pregnant women was obtained using the Schwartz formula.

Biomaterial: it was made from the blood of pregnant women.

Parameters studied: socio-demographic data were: age, number of births, sources of information (radio, television, social networks, newspapers). Knowledge covered the existence of viral hepatitis B, sources of information, the causative agent, routes of contamination, risk factors for infection and means of prevention.

Variables subject to study

- **Variable biological:** HBs Ag and Transaminase
- **Variables sociodemographic:** age, number of births, sources of information, routes of contamination, risky practices And situation matrimonial.

Methods of collection And computer analysis of data: For data collection, we used pre-established survey sheets and the register of the laboratory. The information collected was analyzed manually, entered using Microsoft Word and Excel software under Windows 2016 and the analyzes were carried out using Epi Data software. For the analysis, we used SPSS software version 21. This analysis consisted firstly of a descriptive analysis (means and frequencies) of sociodemographic parameters and knowledge of viral hepatitis B. Secondly, we studied the relationship between knowledge of the existence of viral hepatitis B and sociodemographic factors in multivariate analysis by logistic regression. This relationship was expressed as an Odds ratio with its 95% confidence interval and in degree of significance p (5% significance level).

Methods of diagnostic biological of hepatitis B: We used the immunochromatographic test technique of the Aichek type for the detection of the antigen of surface of HBV in the serum. When the first ^{tests} were positive, the women concerned were recalled to the test once within a two-week interval and always giving the same result (positive).

Operating principle of the HBsAg test: the HBsAg rapid test strip (blood total/serum/plasma) has summer designed For detect HBsAg by the interpretation visual of development of the color of the strip. The membrane was immobilized with antibodies anti-HBsAg on the test region. During the test, the sample reacts with gold conjugates colloid of colored anti-HBsAg antibody, which have been pre-coated on the test sample pad. The mixture then moves on the membrane by capillary action and interacts with the reagents present on there membrane. If he y has enough of HBsAg In THE samples, a band colorful appears at the region - membrane test. The presence of this colored band indicates a positive result, while its absence indicates a negative result. The appearance of a band colored in the control region serves as a procedural control. This indicates that a suitable volume sample has summer added and that one wick effect on there membrane occurred.

Ethical considerations: Before carrying out the study, we obtained agreement and consent from each student, confidentiality was respected throughout the data collection procedure and the results were used for strictly therapeutic and scientific purposes. Our study complied with the 1975 Declaration of Helsinki on Ethical Principles for Medical Research Involving Human Beings as amended in 2008.

RESULTS AND DISCUSSION

Application of the methodology research has leads to the following results in the form of tables interpreted, commented and discussed according to the available literature data.

Table 1. Sociodemographic characteristics of the 215 pregnant women subject to the study

Settings	Effective	Percentage
Age groups		
16-24 years old	28	13.02
25-33 years old	63	29.30
34-42 years old	92	42.79
43 years and over	32	14.88
	Number of births	
Primiparous	53	24.65

Multiparous	162	75.34
Knowledge of the hepatitis B virus		
Yes	47	21.86
No	168	78.13
Source of information		
Radio	107	49.76
Television	52	24.18
Newspapers	7	3.25
Social networks	34	15.81
Schools	15	6.97
Transmission routes		
Sanguine	75	34.88
Sexual	134	62.32
Salivary	6	2.29
Risky practices		
Prostitution	113	52.55
Acupuncture	11	5.11
Piercing	23	10.69
Tattoo	68	31.62
Knowledge of the existence of a vaccine		
Yes	31	14.41
No	184	85.58
Total	**215**	**100**

Painting II: Typology of the results

Exam	Results	Effective	Percentage
Ag HBs	Positives	7	3.25
	Negatives	208	96.74
Total		**215**	**100**

It appears from this table that the age group between 34-42 years old was the most numerous with 42.79% followed by that between 25-33 years old with 29.30%. The age group between 16-24 was the least represented in this study with 13.02%. In relation to the number of births, primiparous women were the least represented with 24.65% compared to 75.34% among multiparous women. In relation to knowledge of the hepatitis B virus, the majority of pregnant women tested claimed to have no knowledge of the virus, 78.13% compared to 21.86% of those who claimed to have knowledge of the virus.

Regarding the sources of information, the majority of pregnant women tested stated radio as their source of information with 49.76%, followed by television with 24.18%. Newspapers represented the least informative source on the hepatitis B virus for these women tested with 3.25%. Regarding the transmission routes, the vast majority of pregnant women tested stated the sexual route with 62.32%, followed by the blood route with 34.88% and by saliva 2.29%. In relation to risky practices, the majority of pregnant women tested pointed to Prostitution with 52.55%, followed by Tattooing with 31.62%, Acupuncture was the lowest risk indicated with 5.11%. In relation to knowledge of the hepatitis B vaccine, the majority of pregnant women tested claimed to have no knowledge of the vaccine with 85.58% compared to 14.41% of those who claimed to be aware of the existence of the vaccine.

The results of this table show that of the 215 women tested for hepatitis B virus, 7 were positive with 3.25% versus 96.74% of women whose test was negative. No cases of invalid was not observed during this test. Which denotes the healthy carrier character of pregnant women. This observed prevalence of hepatitis B virus infection among pregnant women admitted to the Saabou Health Center could be due to lack of knowledge of the virus and its modes of transmission. The hepatitis B virus is 50 to 100 times more contaminating than HIV due to the possibility of contamination by all the biological fluids of the contaminated subject. This table shows that of the 7 pregnant women affected by the hepatitis B virus, there is a variation in the transaminase level:

- 5 pregnant women had a normal ALT level with 71.42% compared to 2 pregnant women who had a high ALT level with 28.57%.
- 6 pregnant women had a normal AST level, i.e. 85.71% compared to 1 pregnant woman who had a high AST level, i.e. 14.28%.

Table III: Pathophysiological variation of transaminase in pregnant women subjected to the test

Transaminase	Values					
	Bass		Normal		High	
	Effective	%	Effective	%	Effective	%
ALAT	**-**	**-**	**5**	**71.42**	**2**	**28.57**
ASAT	**-**	**-**	**6**	**85.71**	**1**	**14.28**

Table IV: Distribution of pregnant women affected by the hepatitis B virus according to socio-professional parameters

Settings	Effective	Percentage
Age groups		
25-33 years old	2	28.57
34-42 years old	4	57.14
43 years and over	1	14.28
Marital status		
Brides	5	71.42
Singles	2	28.57
Socio-professional categories		
Housewives	4	57.14
Commercial agents	1	14.28
Hairdressers	2	28.57
Residence		
Saabou	4	57.14
Petel	1	14.28
Koumy	2	28.57
Total	**7**	**100**

These results clearly show that in pregnant women suffering from hepatitis B, there are variations in transaminase. This could be explained by the fact that infections due to the hepatitis B virus are capable of causing liver damage characterized by an increase in the level of ALT and AST in the blood of patients. It appears from this table that of the 7 pregnant women tested positive for the hepatitis B virus, those in the age group of 34-42 years were the most represented and affected by HBV with 57.14% followed by that of 25-33 years old with 28.57% and finally that of 43 years and over with 14.28%. The high prevalence in the 34-42 age group could be due to their greater representativeness in this study population. It constitutes the sexually active age group. Married people are the most represented by VHB with 71.42% compared to 28.57% among Singles. In relation to socio-professional categories, housewives were the most represented in this series with 57.14%, hairdressers followed with 28.57% and finally sales agents with 14.28%. In relation to their residence, the majority of pregnant women with HBV are from Saabou with 4/7, or 57%, followed by patients from Koumy with 2/7, or 28.57% and the Pétel district with 1/7. , or 14%. The majority of pregnant women are from Saabou because this locality is home to the Health Center.

DISCUSSION

Our study shows that out of a total of 215 pregnant women tested for hepatitis B, 7 were carriers of HBV, or 3.25%, compared to 208 negative cases, or 96.75%. The 34-42 age group presented 4 positive cases of HBV, or 57.14%. Brides who were not only the most represented in the samples, were also the most affected by HBV with 5 cases or 71.42%. Housewives were the most affected by HBV with 57.14%.

Our results are comparable to those of certain authors. Khadidjatou et *al.* in a study in Benin, reported that of the 214 pregnant women surveyed, 30 women were screened positive for HBsAg, representing a prevalence of 14.02% (12). This high prevalence would reflect the situation in a geographical area of high endemicity and clearly reflects the major public health problem posed by viral hepatitis B in our country. These results are superior to those found by Bigot *et al.* during a prospective study carried out in 1989 in Cotonou where the prevalence was 8.26% (13). This discordance of results in these two Beninese studies despite the same methodology used could be explained by the high prevalence of viral hepatitis B in the northern region of the country. Indeed, according to the study carried out among new blood donors in 2013 throughout the Beninese territory, the prevalence of HBV infection was 20.15% in the north and 9.08% in the Littoral and Atlantic departments (14). Our result is similar to those obtained in other studies, particularly in sub-Saharan Africa. Indeed, Candotti *et al.* (15) in Ghana in 2007 found a prevalence of 12.2%. In Sudan, this prevalence was 11% (16). Sangaré *et al.* (17) in Ouagadougou in 2005, Sidibé *et al.* (18) in Bamako, Mali in 2001, Mamadou *et al.* (19) in Niger in 2012 found respective prevalences of 11.4%, 15.5% and 16.6%. On the other hand, this prevalence is significantly higher than those obtained during studies conducted in North Africa and Europe. Indeed, Hannachi *et al.* (20) in Tunisia in 2007, Çévik *et al.* (21) in Turkey found respective prevalences of 4% and 4.2%. This observed difference could be explained by the local epidemiology specific to these different regions. In countries with high endemicity for hepatitis B, the most frequent mode of transmission is mother-to-child transmission. To remedy this, it is recommended to screen pregnant women from the first trimester of pregnancy (12). Or at any time even if they were vaccinated before becoming pregnant (22, 23). In our study, the average age of pregnancies at the time of screening was 31 weeks of amenorrhea.

And more than half of the pregnant women (58.88%) were in the third trimester of their pregnancy. It is therefore up to the midwives and gynecologists at CHUD-B to carry out this screening for all pregnant women from the first trimester of their pregnancy. The HBsAg that we used in our study for screening is a good marker for evaluating HBV carriage in a population since its presence indicates either acute viral hepatitis B or a chronic carriage state. In our study, the age of the pregnant woman was not linked to HBsAg positivity. This is consistent with epidemiological data revealing the high prevalence of perinatal vertical and horizontal transmission of HBV in our country (14,24). In our series, the level of lack of information about the hepatitis B virus is an important factor in the spread of the disease. However, Khadidjatou et *al.* in a study in Benin noted that the associated factor was the level of education and the prevalence of HBsAg varied very little with the level of education (12). Similar results were reported in a study by Angounda *et al.* (25) in Congo. Indeed, in this study, the prevalence of HBsAg seemed to decrease with the level of education but the difference observed was not statistically significant. Our study revealed a statistically significant relationship between HBsAg positivity and family history of viral hepatitis B. The same observation is made by Hannachi *et al.* (26) in Tunisia and Angounda *et al.* (25) in Brazzaville. These results corroborate previous work which showed that the acquisition of the disease occurred before the age of 20, arguing in favor of vertical perinatal and horizontal intrafamilial transmission during childhood and adolescence (26). Intrafamilial transmission at a young age appears to be one of the most important modes of transmission and early detection of infection in pregnant women would allow protection by vaccination of all people living under the same roof, as well as that of the partner. Jaundice is a manifestation present in a large number of pathologies. In our study, all HBsAg-positive pregnant women reported a history of jaundice, revealing a statistically significant relationship. This could be explained by the fact that these women had symptomatic acute hepatitis. Bani *et al.* (27) in Saudi Arabia reached the same result by showing a statistically positive relationship between HBsAg positivity and history of jaundice. It also emerges from the study by Khadidjatou et al. that the existence of scarifications was significantly associated with HBsAg carriage (12). This same observation was made by Sidibé *et al.* (18) in Mali in 2001 and Angounda *et al.* (25) in Congo-Brazzaville in 2014. These results can be explained by the fact that these traditional practices widely spread in our society are carried out in questionable hygienic conditions. Skin breakages with common equipment during scarifications pose a risk of direct contact with contaminated blood, thus promoting the transmission of HBV.

CONCLUSION

Our study shows that out of a total of 215 pregnant women sampled, 7 were positive for HBV, or 3.25%, compared to 208 cases negative for HBV, or 96.75%. The 34-42 age group presented 4 positive cases of HBV, or 57.14%. Brides who were not only the most represented in the samples, were also the most affected by HBV with 5 cases or 71.42%. Housewives were the most affected by HBV with 57.14%. The

low level of knowledge of the women tested on HBV, particularly on prevention (routes of contamination, risky practices and vaccine) reflects the situation of knowledge of the virus in the majority of the country's populations. Vaccination is the most effective means of prevention against this disease which represents the second cause of cancer liver in the world after tobacco. The introduction of radio and television awareness flashes on the circulation of HBV and the existence of the vaccine could help the general population to adopt responsible behavior in order to avoid the transmission of this virus within our populations. In short, this study is part of an investigation campaign into the circulation of HBV among pregnant women in the Mamou prefecture.

Conflicts of interest: none.

Author contributions: all authors contributed to the completion of this study. They read and approved the final version of the manuscript.

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