**Epidemiology and prevalence of HBsAg in pregnant women consulted and followed at the Mangol Health Center in the Urban Commune of Télimélé (Republic of Guinea).**

**ABSTRACT**

Hepatitis B is a viral infection that attacks the liver; its virus persists in the environment for more than 7 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. It constitutes a public health problem. This is a prospective and descriptive study of an analytical type. It took place from April 1 toJune 29, 2024. **Objective:** determine the prevalence of HBsAg within the population of pregnant women consulted and followed at the Mangol 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 234 pregnant women consulted and followed, 3 were positive for HBV, i.e. 1.28% compared to 231 cases negative for HBV, i.e. 98.72%. The 25-33 age group presents 2 positive cases of HBV, representing a prevalence of 66.66%. Brides, who are not only the most represented in this study, are also the most affected by HBV with 2 positive cases, or 66.66%. Compared to the professional case, housewives (housewives) were the most affected with 2 cases, or 66.66%. **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 Télimélé prefecture.

**Keywords:** Hepatitis B, Pregnant women and Telimélé.

1. **INTRODUCTION**

Viral hepatitis B is a liver disease whose causative agent can resist up to 7 days in the external environment. It 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 between 8 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 micro-transfusions during contractions and contact with infected vaginal secretions. The risk is very high because infected children become chronic carriers of the B virus in 90% of cases. It has therefore been recommended since 1992 in France to systematically screen all pregnant women for the presence of HBs antigen (HBs Ag) 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 reach 20 million [ 3]. The World Health Organization (WHO) estimates that more than 2 billion people have been infected with hepatitis B in their lifetime, approximately 30% of the world's population. The hepatitis B virus (HBV) is 50 to 100 times more contaminating than HIV. Among the global patient population, 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, including 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) among a sample of people insured under the general Social Security system between 2003 and 2004, reported a rate of chronic carriage of HBV estimated at 5.25% among subpopulations. -Saharan Africa and 0.92% among people from Asia compared to 0.68% in the general population. Also, it has been found that only 45% of HBsAg carriers know their serological status, which leads to a delay in treatment and increases the risk of disease transmission [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 Côte d'Ivoire, the prevalence is 9% [7]. In Mauritania, the prevalence varies between 16 and 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 2019, the World Health Organization (WHO) estimated that more of 91 million of Africans are living with hepatitis B and 1.2 million new HBV infections have been recorded in the African region, as well as 125,000 deaths linked to this disease. Deaths which occur mainly among population groups comprising people youth and productive (WHO, 2023) [28].

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, all sexes and all socio-professional strata.

**II. MATERIALS AND WORKING METHODS**

**II.1 Environment and setting of the study: this study was carried out at the** Mangol Health Center in the Urban Commune of Télimélé. The laboratory of medical biology​ the Institute Superior of Technology of Mamou has served of study framework for carrying out this present work. The Mamou Higher Institute of Technology is a professional public establishment, attached to the Ministry of Higher Education, Scientific Research and Innovation (MESRSI). It was created by Decree No. 2004/9245/MESRS/CAB of August 25, 2004 as part of the decentralization of higher education establishments (IES) in the Republic of Guinea. Since its creation, it has six (6) Departments including that of Laboratory Techniques.

**II.2** **Working equipment: to carry out this work, we used the following equipment: electric centrifuge,** Aichek chromatographic immune test strip, stopwatch, pasteur pipette, hydrophilic cotton s, latex gloves, 5cc syringes, hemolysis tubes, boxes of security and garbage can.

**II.3 Working method:** this is a longitudinal, prospective and descriptive study which took place from April 1 to June 29, 2024. Pregnant women followed at the Mangol Health Center were OUR study population. Were included in this study, all pregnant women received and monitored at the Mangol Health Center and who have accepted to submit to our study. Sampling has summer random simple and the sample size was n = 234 pregnant women, using the Schwartz formula.

**II.4 Biomaterial:** blood collected from pregnant women was used as biomaterial.

**II.5 Parameters studied:** sociodemographic 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.

**II.6 Variables subject to study**

* **Variable biological:** HBs Ag and Transaminase
* **Variables sociodemographic:** age,number of births, sources of information, routes of contamination, risky practicesandsituation marital.

**II.7 Methods of collection and computer analyzes of data**

For data collection, we used pre-established survey sheets and 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 firstly consisted 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 as a degree of significance p (5% significance level).

**II.8 Methods of diagnostic biological hepatitis B**

Aichek type chromatographic immune test technique for the detection of the antigen of surface of HBV in the serum. When the first testswere positive, the women concerned were called back for a 2nd test 2 weeks apart and always giving the same result (positive).

**Operating principle of the HBs Ag test: the** HBs Ag rapid test strip (analysis total/serum/plasma) has summer designed for detect HBsAg​​ by the interpretation visual of the evolution of the color on the strip. The membrane was immobilized with antibodies anti- HBsAg on the test region. During the test, the sample reacts with the gold conjugate Colored anti- HBsAg antibody colloid, which has been pre-coated onto the test sample pad. The mixture then moves across the membrane by capillary action and interacts with the reagents present on the membrane. If yes there is enough of HBsAg in the samples, a band​ colorful appears in the region - membrane test. The presence of this colored band indicates a positive result, while its absence indicates a negative result. The appearance of the band colored in the control region serves as a procedural control.

**II.9 Ethical considerations**

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

**III. RESULTS AND DISCUSSION**

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

**Table I: Sociodemographic characteristics of 234 pregnant women subject to the study**

|  |  |  |
| --- | --- | --- |
| **Settings** | **Effective** | **Percentage** |
| **Age groups** |
| 16-24 years old | 32 | 13.67 |
| 25-33 years old | 87 | 37.17 |
| 34-42 years old | 90 | 38.46 |
| 43 years and over | 25 | 10.68 |
|  | **Number of births** |  |
| Primiparous | 61 | 26.07 |
| Multiparous | 173 | 73.93 |
| **Knowledge of the hepatitis B virus** |
| Yes | 53 | 22.65 |
| No | 181 | 77.35 |
| **Information source** |
| Radio | 94 | 40.17 |
| Television | 72 | 30.76 |
| Newspapers | 7 | 2.99 |
| Social networks | 36 | 15.38 |
| Schools | 25 | 10.68 |
| **Transmission routes** |
| Sanguine | 71 | 30.34 |
| Sexual | 154 | 65.81 |
| Salivary | 9 | 3.85 |
| **Risky practices** |
| Prostitution | 127 | 54.27 |
| Acupuncture | 8 | 3.42 |
| Piercing | 26 | 11.11 |
| Tattoo | 73 | 31.10 |
| **Knowledge of the existence of a vaccine** |
| Yes | 43 | 18.37 |
| No | 191 | 81.62 |
| **Total** | **234** | **100** |

It appears from this table that the age group between 34-42 years old was the most represented in this study with a rate of 38.46% followed by that between 25-33 years old with a rate of 37.17%. The age group 43 and over was the least represented in this study with a rate of 10.68%.

In relation to the number of births, first-time women were the least represented with a rate of 26.07% compared to 73.93% for multi-parous women.

Regarding knowledge of the hepatitis B virus, the majority of pregnant women tested declared having no knowledge of the virus, i.e. 77.35% compared to 22.65% of those who declared having knowledge of the virus.

Concerning the sources of information, the majority of pregnant women interviewed indicated the radio as a source of information, i.e. 40.17% of these women, followed by television with 30.76%. Newspapers represented the least informative source of information on the hepatitis B virus for these women tested, i.e. 2.99%.

Concerning the routes of transmission, the vast majority of pregnant women tested indicated the sexual route as being the main route of transmission of the virus, with 65.81%, followed by the blood route with 30.34% and by saliva with 3.85%.

Regarding risky practices, the majority of pregnant women tested cited prostitution as the main risky practice with 54.27%, followed by tattooing with 31.10 %, acupuncture was the risky practice the lowest indicated with 3.42%.

Regarding knowledge of the hepatitis B vaccine, the majority of pregnant women tested declared having no knowledge of the vaccine, i.e. 81.62% of these women compared to 18.37% of those who declared knowledge of the vaccine. existence of the vaccine.

**Table II: Typology results**

|  |  |  |  |
| --- | --- | --- | --- |
| **Exam** | **Results** | **Effective** | **Percentage**  |
| Ag HBs | Good points  | 3 | 1.28 |
| Negative points | 231 | 98.72 |
| **Total** | **234** | **100** |

The results of this table show that of the 234 women tested for the Hepatitis B virus, only 3 women were positive for HBs Ag with a rate of 1.28% compared to 231 women tested negative for this virus, i.e. 98 .72%. No cases of disability were not observed in this study.

This observed prevalence of hepatitis B virus infection among pregnant women followed at the Mangol Health Center could be due to a 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 and its resistance in the external environment.

**Table III: Pathophysiological variation of transaminases in pregnant women positive in the chromatographic immune test for the detection of HBsAg**

|  |  |
| --- | --- |
| **Transaminases** | **Values** |
| **Low** | **Normal** | **High** |
| **Effective** | **%** | **Effective** | **%** | **Effective** | **%** |
| **ALAT** | **-** | **-** | 2 | 66.66 | 1 | 33.33 |
| **ASAT** | **-** | **-** | 3 | 100 | 0 | 0 |

This table shows that of the 3 pregnant women affected by the hepatitis B virus, there is a variation in the level of transaminases:

* 2 pregnant women had a normal ALT level, i.e. 66.66% compared to 1 pregnant woman who had a high ALT level, i.e. 33.33%.
* 3 pregnant women had a normal AST level, i.e. 100%. No cases of elevated AST were observed.

These results clearly show that in pregnant women with hepatitis B, there may be variations in transaminases. This could be explained by the fact that infections caused by the hepatitis B virus are capable of causing liver damage characterized by an increase in AL AT levels. As for the AST level (non-specific liver enzyme), its elevation could mean an attack on other sensitive organs including the heart, lungs, muscles, kidneys, etc.

**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 | 66.66 |
| 43 years and over | 1 | 33.33 |
| **Civil states** |
| Brides | 2 | 66.66 |
| Bachelor | 1 | 33.33 |
| **Socio-professional categories** |
| Housewives | 2 | 66.66 |
| Hairdresser | 1 | 33.33 |
| **Residential homes** |
| Kolly | 1 | 33.33 |
| Dara | 1 | 33.33 |
| Barkéré | 1 | 33.33 |
| **Total** | **3** | **100** |

It appears from this table that among the 3 pregnant women tested positive for the hepatitis B virus, those in the age group of 25-33 were the most affected with a prevalence of 66.66 % followed by that of 43 years and over with a prevalence of 33.33%.

Married women were not only the most represented in this study, they were also the most affected with a prevalence of 66.66% compared to 33.33% for single women positive for the hepatitis B virus with just one case.

Compared to socio-professional categories, housewives or housewives were the most affected with 2 cases, i.e. 66.66% compared to 33.33% cases of a single female hairdresser.

Compared to their residences, the results of this table show that each of these three HBV positive women came from a different neighborhood, they came from Kolly , Dara and Barkéré , i.e. 33.33% for each of these neighborhoods by relation to this study. This demonstrates that HBV is circulating in this urban commune of Télimélé.

**IV. DISCUSSION**

Our study shows that out of a total of 234 pregnant women tested for hepatitis B, 3 were carriers of HBV, or 1.28%, compared to 231 negative cases, or 98.72%. The 25-33 age group presents 2 positive HBV cases, or 66.66%. Brides who were not only the most represented in this study, were also the most affected by HBV with 2 cases, or 66.66%. Housewives or housewives were the most affected by HBV with 2 cases, or 66.66%.

In countries with high hepatitis B endemicity, the most common 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 pregnant women (58.88%) were in the third trimester of their pregnancy. It is therefore up to CHUD-B midwives and gynecologists 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 assessing 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 related to HBsAg positivity. This is consistent with epidemiological data revealing the high prevalence of vertical and horizontal perinatal transmission of HBV in our country [14,24].

Our results are comparable to those of certain authors. Khadidjatou et *al.* in a study in Benin, reported that of the 214 pregnant women interviewed, 30 women 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 higher than those found by Bigot et al, during another prospective study carried out in 1989 in Cotonou where the prevalence was 8.26% [ [13](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6814903/#cit0013) ]. This discrepancy in the results of 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 departments of the Coast and the Atlantic [ [14](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6814903/#cit0014) ]. Our results are similar to those obtained in other studies, particularly in Sub-Saharan Africa. Indeed, Candotti et al. [ [15](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6814903/#cit0015) ] 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](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6814903/#cit0017) ] 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 carried out in North Africa and Europe. Indeed, Hannachi et al. [20] in Tunisia in 2007, Cévik et al. [ [21](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6814903/#cit0020) ] 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 our series, the lack of information on the hepatitis B virus is an important factor in the spread of the disease. However, Khadidjatou et *al,* in a study in Benin, it was noted that the associated factor was the level of education and that the prevalence of HBsAg varied very little with the level of education [12]. Similar results were reported in a study from 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 make it possible to protect through vaccination 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 suffered from symptomatic acute hepatitis. Bani et al. [27]. In Saudi Arabia, they achieved the same result by showing a statistically positive relationship between HBsAg positivity and history of jaundice. It also appears 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 ext al. [25]. In Congo-Brazzaville in 2014. These results can be explained by the fact that certain traditional practices widely spread in our societies are carried out in questionable hygienic conditions. Skin breaks with common equipment during scarification present a risk of direct contact with contaminated blood, thus promoting the transmission of HBV.

**V. CONCLUSION**

Our study shows that out of a total of 234 pregnant women screened for HBsAg, 3 were positive, or 1.28%, compared to 231 negative cases, or 98.72%. The 25-33 age group presents 2 positive HBV cases, or 66.66%. Brides who were not only the most represented in this study, they were also the most affected by HBV with 2 cases or 66.66%. Housewives or housewives were the most affected by HBV with 2 cases, or 66.66%.

Vaccination is the most effective means of prevention against this disease which represents the second cause liver cancer​ in the world after tobacco. The low level of knowledge of the women tested on HBV, particularly on prevention (routes of contamination, risky practices and vaccine) reflects the state of knowledge of the virus in the majority of the country's populations.

The implementation 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 summary, this study is part of an investigation campaign into the circulation of HBV among pregnant women in the Télimélé prefecture.

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