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The Characteristics of the Biological Markers of Pregnant Women Carrying the Hepatitis B Virus in the Hepato-Gastroenterology Unit of the District Hospital of Commune IV in Bamako (Mali)

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Abstract **Original Research Article**

***Introduction*:** Hepatitis B virus (HBV) infects more than 2 billion people worldwide, with more than 257 million chronic carriers and 88,700 deaths per year. In Mali, the prevalence of HBsAg in the general population is estimated at 14.7% [2] and 15.5% in pregnant women. The objective of this work was to describe the characteristics of the biological markers of pregnant women carrying the hepatitis B virus in the hepato-gastroenterology unit of the district hospital of commune IV of Bamako (Mali). ***Patients and Methods*:** This was a descriptive cross-sectional study that took place at the district hospital of commune IV of Bamako between March 1, 2020 and February 1, 2021. The study population was consisting of pregnant women referred to our unit for positive HBSAg detected during prenatal biological examinations. Were included in this study, the pregnant women referred for Ag HBS positive and who made the biological markers of follow-up. Were not included, those who did not make the biological markers. ***Results*:** During the study period, we received 177 pregnant carriers of the hepatitis B virus out of 1008 consultations, ie a frequency of 13.09%. Among the 177 pregnant women referred to our unit, 132 were able to carry out the biological markers, i.e. a completion rate of 74.58%. The age of the patients varied between 16 and 44 years with an average age of 28.5 years ± 6.6. HBsAg was discovered in 81.1% of women during the current pregnancy and it was prior to pregnancy in 18.9%. Positive viral markers in pregnant women were: HBeAg (6.8%), anti- HBe Ac (84.8%), anti - HBc Ac IgG (100%). Viral DNA was undetectable in 17.4% of pregnant women, it was between 1-2 million IU/ml in 77.3% and greater than 2 million IU/ml in 5.3%. ***Conclusion*:** This study showed a high frequency of hepatitis B virus infection during pregnancy. A better knowledge of serological markers, particularly in pregnant women, seems to be the most effective means of combating this scourge.

Keywords: Biological markers, pregnant carriers, hepatitis B virus.

INTRODUCTION

Hepatitis B virus (HBV) infects more than 2 billion people worldwide according to the WHO in 2019, with more than 296 million people being chronic carriers, 1.5 million new infections and around 820,000 deaths [1].

In Mali, the prevalence of HBsAg in the general population is estimated at 24.9% [2] and 15.5% in pregnant women [3].

Hepatitis B virus (HBV) infection is a common condition during pregnancy [1]. Its screening makes it possible to prevent its transmission to the newborn in approximately 95% of cases, on the express condition that the preventive treatment (Serovaccination) is undertaken within the first 12 hours of life [2].

The severity of hepatitis B is linked to the risk of becoming chronic, which is all the more frequent

when the infection occurs at an early age, particularly in the case of neonatal contamination [3].

Mother-to-child transmission is the main cause of hepatitis B transmission worldwide (35–50%) and of chronic HBsAg carriage (90%) in countries with high prevalence [4].

In fact, the risk of HBV transmission from mother to child depends on the extent of viral replication. This risk has been estimated at over 90% if HBe antigen (HBeAg) is detected in maternal serum. The presence of HBeAg has also been associated with a high risk of neonatal prevention failure [5].

However, even in the absence of HBeAg, the risk of HBV transmission persists [6].

Transmission of the virus despite active and passive immunization of the newborn is associated with high maternal viremia (HBV-DNA > 200,000 IU/ml) [7].

Demonstration of HBsAg positivity in a woman during her pregnancy warrants specialist advice and systematic serological investigation (HBsAg, anti-HBc antibodies, anti- HBs antibodies) in the family environment [8].

Very few studies have been carried out on this subject in Mali and there are no data on this condition in commune IV of the district of Bamako.

A better knowledge of serological markers in pregnant women can help to put in place a strategy to eliminate the threat to public health.

The objective of this work was to describe the characteristics of the biological markers of pregnant women carrying the hepatitis B virus in the hepato-gastroenterology unit of the district hospital of commune IV of Bamako (Mali).

PATIENTS AND METHOD

This was a descriptive cross-sectional study that took place at the district hospital of commune IV of Bamako. The study lasted 1 year from March 1, 2020 to February 1, 2021. The study population consisted of pregnant women referred to our unit for positive HBSAg detected during prenatal biological examinations.

Were included in this study, the pregnant women referred for Ag HBS positive and who made the biological markers of follow-up. Were not included, those who did not make the biological markers.

A carefully designed questionnaire was used to collect the data. The variables studied socio-demographic characteristics (surname, first name, age, sex, profession, residence, contact, marital status), marital status (monogamy, polygamy, divorced, widowed, single), gesture (primigest or multi - gesture), circumstance of discovery (recent or previous HBV), personal or family history of liver disease, biological markers (Ag HBe, Ac anti HBe, Ac anti HBc IgG, anti-HBc Ab IgM, viral B DNA, transaminasemia), liver ultrasound (normal or abnormal), treatment (eligible or not for tenofovir).

The study was carried out in accordance with the requirements of the Declaration of Helsinki and in accordance with the bioethical recommendations recorded in appendix C of standard ISO15189 v. 2007.

Data were entered using Epidata 3.1 software and then transported and analyzed using Epi-info 6.0 software.

RESULT

During the study period, we received 177 pregnant carriers of the hepatitis B virus out of 1008 consultations, ie a hospital frequency of 13.09%. Among the 177 pregnant women referred to our unit, 132 were able to carry out the biological markers, i.e. a completion rate of 74.58%.

The age of the pregnant women varied between 16 and 44 years with an average age of 28.5 years ± 6.6.

In our series, the marital status was composed as follows: married women (90.9%), singles (6.8%), divorced (1.5%) and widows (0.8%).

The professions of pregnant women were distributed as follows: civil servants (11.4%), housewives (59.8%), shopkeepers (12.9%), workers (7.6%), pupils/ students (5.3%), seamstresses (3%). The primigests represented 24.2% and the multigestures 75.8%.

HBsAg was discovered in 81.1% of women during the current pregnancy and it was prior to pregnancy in 18.9%.

Positive viral markers in pregnant women were: HBeAg (6.8%), anti- HBe Ab (84.8%), anti - HBc Ab IgG (100%) (Table I).

Viral DNA was undetectable in 17.4% of pregnant women, it was detected below 200,000 IU/ml in 77.3% and above 200,000 IU/ml in 5.3% (Table II).

ALT and AST were high respectively in 3% and 2.3% of pregnant women. Liver ultrasound performed was normal in 98.5% of pregnant women and abnormal in 1.5% of pregnant women.

Table I: Distribution of pregnant women according to viral markers

Viral markers		Effective	Percentage
Ag HBe	Positive	9	6.8
	Negative	123	93.2
Anti- HBe Ac	Positive	112	84.8
	Negative	20	15.2
Anti- HBc Ab IgG	Positive	132	100
	Negative	0	0
Anti- HBc Ab IgM	Positive	0	0
	Negative	132	100

Table II: Distribution of pregnant women according to viral load

Viral DNA: IU/ml	Effective	Percentage
Undetectable	23	17.4
1-200,000	102	77.3
>200,000	7	5.3
Total	**132**	**100**

DISCUSSION

This is, to our knowledge, the first study carried out on the characteristics of the biological markers of pregnant women carrying the hepatitis B virus at the hepato-gastroenterology unit of the district hospital of the commune IV of Bamako (Mali).

We received 177 pregnant women for carrying the hepatitis B virus out of 1008 consultations, i.e. a frequency of 13.09% lower than that of the general Malian population [2] but superimposable on that of the work carried out in the West African sub-region [3, 10, 11], higher than that of North Africa [12, 13]. This difference could possibly be related to local epidemiology. According to the literature, HBV is endemic with a different prevalence depending on the region of the globe [14].

The average age of pregnant women was 28.5 years ± 6.6 with extremes of 16 and 44 years and the age group 21 to 30 years the most represented is 50.7%. This average age is similar to that reported by different series in Africa [15, 16].

This young age could be related to early perinatal contamination and also the sexually active period, thus exposing itself to more risks [17].

Most of the pregnant women resided in commune IV of the district of Bamako, i.e. 85.6% of cases. This observation would explain the high attendance of the structure by the local population.

Housewives were in the majority with 59.8%, similar to the series of Sidibé S which reports 49.1% [3] but lower than that of Abdoulaye O *et al.*, who had reported 85% of housewives [17]. These data could be the fact that housewives are the most numerous in our countries.

According to marital status, married pregnant women were in the majority with 90.9%, lower than the rate of Kasia JM *et al.*, which was 35% [16]. This difference could be related to the sampling and/or the polygamous factor.

In this series, there were more pregnant women married in a monogamous household, i.e. 70.8%. Abdoulaye O *et al.*, had found more married women in a polygamous household [17]. Polygamy being allowed in our circles, this difference could be related to our samples.

More pregnant women were detected in the second trimester, ie 81.82%. These results are in agreement with data from the literature [18, 19] because the risk of mother-to-child transmission is more frequent when hepatitis B occurs during the third trimester [18].

Despite the relative youth of the study population, it is constituted in more than 75.6% of women who have had at least 2 pregnancies. Consistent with the data of Sidibé S *et al.*, who had reported more than 75% in their series [3].

Our series reported that 81.1% of pregnant women were unaware of their status, which is similar to the data of Abdoulaye O *et al.*, where 100% were unaware [17], for Hannachi in Tunisia, 96.8% were unaware of their serological status [13]. These results prove one more reason to accentuate systematic screening in this population.

HBeAg was present in 6.8% of cases, lower than the Harder KM *et al.*, data which reported 17% [20].

According to the literature, the risk of maternal - fetal transmission is 90% when HBeAg is positive,

whereas it is only 10 to 20% when HBeAg is negative [21].

The viral load was below 200,000 IU/ml, i.e. in 77.3% of cases and above in 5.3% of cases. According to the literature, a high viremia above 200,000 IU/ml is a source of mother-to-child transmission of the hepatitis B virus [22].

In this study, all pregnant women were chronic carriers of the hepatitis B virus, moderate cytolysis below 2N at the expense of ALT was observed in 3% of cases among those who had viral replication and hepatic ultrasound was normal in almost all of the pregnant women, i.e. 98.5% of cases, 2 pregnant women had homogeneous hepatomegaly without other abnormalities.

These results are in line with the data in the literature or in pregnant women, in 98% of cases it is a chronic asymptomatic carrier state for HBsAg ; the level of transaminases is normal [23].

During these additional examinations, 13 pregnant women, or 9.8%, were put on antiviral treatment (Tenofovir) from the third trimester of pregnancy.

Our study experienced shortcomings due to the small size of the sample explained by the financial means, the insufficiency of the technical platform and the lack of information, but representative enough to describe the characteristics of the serological markers of HBV in pregnant women.

CONCLUSION

The frequency of the hepatitis B virus is high during pregnancy. A better knowledge of serological markers, particularly in pregnant women, seems to be the most effective means of combating this scourge. Reinforcement measures must be taken by politicians for better care of these most often diminished populations.

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