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Transmission of Hepatitis B in Newborn Mothers with Positive Hbs in the Csref of Commune V of the District of Bamako

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Abstract

The main cause of chronic HBsAg carriage is mother-to-child transmission. The aim of the study was to determine the epidemiological, clinical and biological aspects of mother-to-child transmission of the hepatitis B virus in newborns of HBsAg-positive mothers. ***Methodology:*** This was a descriptive cross-sectional study which took place from 1 March 2020 to 30 June 2021 at the CSREF in Commune V. Sampling was exhaustive, and all newborns whose mothers were carriers of hepatitis B were included in the study. ***Results****:* One hundred and twenty newborns out of 3197 referred from the maternity unit, representing a frequency of 3.7% of hepatitis B in pregnant women. Eighty newborns were included. The other 40 were not included because the mothers refused. Among the mothers, 11/80 tested positive for HBeAg and anti-HBs, with 2 positive results (18.18%). Twelve pregnant women had viral load tests, with two positive results (16.66%). Six of the 80 pregnant women had received tenofovir during pregnancy (7.5%), and all the newborns had negative HBsAg results at 4 months of age. ***Conclusion :*** Low realization of viral markers of hepatitis B and treatment during pregnancy.

Keywords : Newborn, HBsAg; paediatrics.

INTRODUCTION

Hepatitis B is an inflammation of the liver caused by the hepatitis B virus. It is transmitted by blood, sex or from an infected pregnant mother to her unborn child [1]. The risk of mother-to-child transmission of HBV and progression to chronic disease is high when the mother is HBsAg positive [2]. Worldwide, mother-to-child transmission (MTCT) of hepatitis B is responsible for 25-50% of HBV-related infections. The risk of transmission depends on the mother's viral load and HBeAg status (5-35% if HBeAg negative, 70-90% if HBeAg positive) [3]. The prevalence of infection varies from one region of the world to another: 0.5% in the USA and Northern Europe; 1-2% in Southern Europe, Japan and South America; 5-15% in South-East Asia and tropical Africa [4,5]. The particularity of HBV in all high-prevalence countries is that it is frequently transmitted to children, particularly vertically from mother to child. HBs antigen is present in 15.5% of pregnant women, and has been found in 43.2% of children born to HBs antigen-positive mothers [6,7]. Sub-Saharan Africa is a region of high prevalence, with carriage varying from 8 to 20% depending on the country [8,9]. Transmission of the virus from mother to child is due to exposure of the newborn to maternal secretions as it passes through the genital tract or during the neonatal period. However, transmission in utero appears to be rare, accounting for 2-5% of perinatal infections. In view of the relevance of the chronicity of hepatitis B virus disease, which is largely due to mother-to-child transmission of this virus, and in the absence of any studies on this subject at CSREF CV, we initiated this study, the aim of which was to determine the epidemiological, clinical and biological aspects of mother-to-child transmission of the hepatitis B virus in newborns of HBsAg-positive mothers.

METHODOLOGY

This was a descriptive cross-sectional study that took place from 1 March 2020 to 30 June 2021 and included all newborns referred to the neonatology unit of the paediatrics department of the Csréf in Commune V. We included all newborns whose mother's serological status for the hepatitis B virus was known and positive. The following were not included in our study

- Any newborn whose mother's hepatitis B virus serostatus was unknown or negative,
- Mothers who did not wish to participate in the study.

The maternal variables studied were age, occupation, marital status, viral load, antiviral treatment during pregnancy, and the neonatal variables were birth weight, mode of delivery, viral markers, clinical status at birth, and sero-vaccination.

An individual survey form was drawn up for data collection. Data were collected from hospital records, mothers' follow-up diaries, and the neonatal admission register. Statistical data were processed and analysed using SPSS version 22 software. The free and informed consent of the mothers of the newborns was sought and obtained prior to their inclusion in this study. Participants' anonymity was guaranteed.

RESULTS

During the study period, we recorded 120 newborns out of 3197 referred, representing a maternal hepatitis B carriage rate of 3.7%. The study covered 80 of the 120 newborns who met the criteria. Forty mothers did not agree to take part in the study. Housewives accounted for more than half of the mothers (58.75%). Almost half of them (48.75%) were aged between 20 and 30, with an average age of 29.

Table 1: Distribution by maternal characteristics

Profession	**N=80**	**Percentage (%)**
Retailer	9	11,25
Dressmaker	3	3,75
Student	10	12,50
Teacher	4	5,00
Housekeeper	47	58,75
Secretary	2	2,50
Other	5	6,25
Age group(year)	**N=80**	**Percentage (%)**
16-19	4	5,00
20-30	39	48,75
30-40	37	46,25
Delivery route	N= 80	Percentage
Low	76	95%
Caesarean section	4	5%
HBeAg result	**N=11**	**Percentage (%)**
Positive	02	18,18
Negative	09	81,82
anti-HBs	**N=80**	**Percentage (%)**
Yes	11	13,8
No	69	86,20
Viral load	**N=12**	**Percentage (%)**
Detectable	02	16,66
Undetectable	10	83,34
ARV	**N= 80**	**Percentage (%)**
Yes	06	7,50
No	74	92,50

Among the mothers, 11/80 pregnant women had tested for HBeAg and anti-HBs, and the results came back positive in 2, or 18.18% each. Twelve pregnant women had viral load tests, which were detectable in 2 (16.66%). Six pregnant women out of 80 (7.5%) had received tenofovir-based treatment during pregnancy. Ninety-five percent of the newborns were born vaginally and 96.25% were eutrophic with a birth weight of between 2500 and 3999 g. The average weight was 2888 g. Ten percent had presented signs of Neonatal infection (Table II).

Table II: Distribution of newborns by characteristics

Birth weight	**N=80**	**Percentage (%)**
2500 à 3999 g	77	96,25
4000 g et plus	3	3,75
Clinical condition at birth	**N=80**	**Percentage (%)**
Normal	72	90,00
Signs of NIN	08	10,00
Mode of delivery	**N=80** 76 4	**Percentage (%)** 95,00 5,00
vaginal delivery	**N=80**	**Percentage (%)**
Caesarean section	80	100,00
HBsAg result	**N=80**	**Percentage (%)**
HBsAg negative	23	28,75
HBsAg positive	**N=67**	**Percentage (%)**
Viral markers	54	80,60
Anti-HBs negative	13	19,40

Eighty-three per cent of newborns had been sero-vaccinated at birth. At 4 months of age, all infants were HBs antigen negative and anti-HBs antibody positive in 71.25% of cases. No clinical manifestations of hepatitis B were found at this age.

DISCUSSIONS

Frequency

In this study, the frequency of maternal carriage of hepatitis B was 3.7%. Our results are lower than those reported in Côte d'Ivoire (5.4%) in 2017 [10], Mauritania (5%) in 2021 [11], Benin (14.02%) in 2017 [12] and Burkina 2009 (11.4%) [13]. According to the WHO Hepatitis Scorecard 2019, the HBV prevalence rate in Mali is estimated at 8.5% in the general population and 4.9% in children aged < 5 years [14].

Maternal Characteristics

The 20-30 age group was the most represented, with a frequency of 48.75%. The mean age was 29 ±0.6 years, ranging from 18 to 40 years. This age group is sexually active and more exposed to risk. Chracerh. K [15] found an average age of 30.36 ± 4.9 years, with extremes of 22 and 37 years. In contrast to our results, Mohamed O *et al.*, report a more frequent age range of 32 to 36 years, i.e. 42.86% with an average age of 27 years (extremes: 19 - 37 years) [16].

The mother's serological status was a determining factor in the risk of transmission to newborns. In this series, only 13% of pregnant women tested positive for HBeAg (11/80) coupled with anti-HBS antibodies. This result was positive in 18.18% each (2/11). BA A, in a study conducted in Burkina Faso, reported 8% of a sample of 50 mothers who tested positive for HBeAg [17]. HBeAg was positive in one pregnant woman in the series by Chracerh. K [15]. The presence of the replication antigen (HBeAg) in pregnant women is the main risk factor for maternal-foetal transmission. Twelve pregnant women out of 80 had a viral load, i.e. 15 per cent. The detectable viral load was only 16.6%. The hepatitis B viral load was undetectable in 6 pregnant women, i.e. 42.86% in the series by Chracerh. K [15]. The risk of vertical transmission is very high if the viral load is detectable.

In our study, 92.5% of the mothers had not received Tenofovir prophylaxis. Mohamed O [16] reports that antiviral treatment was prescribed before the start of pregnancy in 8 cases, continued throughout the pregnancy and interrupted at 1 or 2 months postpartum. In 60% of cases, the antiviral treatment prescribed was tenofovir. In July 2020, the WHO published recommendations on the use of antivirals during pregnancy in HBsAg-positive women [18]. All HBsAg-positive pregnant women with HBV DNA ≥ 5.3 log10 IU/mL (≥200,000 IU/mL) should receive tenofovir from the 28th week of pregnancy until the child is vaccinated [18]. In locations where viral load testing is not available, HBeAg can be used to determine eligibility for tenofovir [18,19]. The fact that HBeAg is not carried out in all pregnant women explains the low uptake of treatment (7.5%) during pregnancy in the estantes in our study.

Characteristics of Newborns

Serovaccination was administered to 80.6% of newborns and 19.4% had received the vaccine alone. This result differs from that obtained by Diarra A in Koulikoro, who reported 92.6% for the vaccine alone [20]. Other authors report serovaccination rates similar to ours, i.e. 80% according to Chracerh [15]. Sero-vaccination of any child born to an HBsAg-positive mother should begin within 12 to 24 hours of birth. A meta-analysis published in 2006 assessed the efficacy of immunoglobulins and the birth dose of vaccine in reducing the risk of MTCT, compared with the birth dose alone. The combination of immunoglobulins and a dose of vaccine at birth significantly reduced HBV infection in children born to HBsAg-positive mothers, compared with a dose given at birth alone [21].

In our study, the newborns were received after four (4) months of life and showed no clinical sign of infection with the hepatitis B virus. Monitoring of transmission (HBsAg) and vaccination efficacy (anti-HBsAc) in our study did not reveal any HBsAg carriers among the infants, unlike the study conducted by BA A [17] in Burkina Faso, where HBsAg was positive in 3.9% of sera collected. Anti-HBs was positive in 71.25%. Several studies have reported the prevalence of HBsAg in children born to HBsAg-positive mothers in Benin (20%) and Tunisia (27%) [6, 10].

CONCLUSION

Low levels of hepatitis B viral markers, particularly HBeAg and viral load, among mothers. In our study, the presence of anti-HBs antibodies in 71.25% of newborns highlights the importance of sero-vaccination in preventing mother-to-child transmission of hepatitis B.

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