



MOTHER TRANSMISSION - CHILD OF THE HEPATITIS B VIRUS IN A REFERENCE HOSPITAL IN IVORY COAST

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ARTICLE INFO

Article History:

Received 10th September, 2018

Received in revised form 2nd October, 2018

Accepted 26th November, 2018

Published online 28th

December, 2018

Key words:

VHB - antenatal transmission - Abidjan

ABSTRACT

Aims: To determine the seroprevalence of HBsAg in pregnant women and to determine the incidence of mother-to-child transmission.

Patients and methods: It was a prospective longitudinal study with a descriptive and analytical aim that took place in the maternity ward and in the pediatric department of the CHU of Cocody for 7 months. All newborns whose mothers were HBsAg carriers were included. The parameters studied in pregnant women were socio-demographic data, medical history, risk factors for HBV transmission, mode of delivery, and viral load. Concerning the newborn, the studied parameters were sex, gestational age, birth weight, HBsAg assay

Results: 231 pregnant women were carriers of HBs Ag antigen, an overall frequency of 5.4%. The incidence of mother-to-child transmission was 23.3%. This transmission was statistically related to the high viral load in the mother ($p = 0.014$). There was a statistical relationship between HBV infection and the occurrence of fetal hypotrophy ($p = 0.008$)

Conclusion: Health Education Program Focused on Preventing Vertical Transmission of HBV Must Accompany Expanded Infant Immunization Coverage

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INTRODUCTION

The hepatitis B virus (HBV) infects more than 2 billion people worldwide, with more than 257 million chronic carriers [1]. It is responsible for 88,700 deaths per year [1]. HBV infection increases the risk of premature death from hepatocellular carcinoma (HCC) or cirrhosis by 15 to 25% [1]. A universal immunization program was introduced in 1991 by the World Health Organization, leading to a significant decrease in the prevalence of HBV in the world [2,3]. Despite this, sub-Saharan Africa is still considered as an area of high endemicity with a high prevalence of 8% [4], particularly Côte d'Ivoire or viral hepatitis B, which poses a major public health problem. The prevalence in this country was estimated at about 11.6% [5] and the perinatal incidence was estimated at 32.8% [6]. This mother-to-child transmission plays a major role in the chronic carriage of HBV with a high risk of chronic hepatopathies and hepatocellular carcinoma. We initiated this study whose overall goal was to contribute to the reduction of mother-to-child transmission of hepatitis B virus. The specific objectives were to describe the characteristics of mothers, to determine the seroprevalence of hepatitis B infection in

mothers, and the prevalence of mother-to-child transmission of hepatitis B virus.

METHOD

It was a prospective longitudinal study with a descriptive and analytical aim that took place at the maternity ward of the Obstetrics Gynecology Department and in the Pediatric Department of the Cocody CHU from December 1st, 2016 to June 30th, 2017 (07 months). All newborns whose mothers were HBsAg carriers were included. The children who were not included were those whose mothers had given birth to a stillbirth and mothers who had not given their consent for the study. The course of the study consisted of informed consent from parturients, about the benefits of the study, to a rapid diagnostic test (RDT) for hepatitis B. When this test returned positive, a questionnaire was submitted to the parturients and venous blood samples were taken from mothers for confirmation of HBsAg positivity in the laboratory and viral load determination and then HBs antigen neonates were searched for in the cord blood, avoiding contamination by maternal blood. The newborns received after this sample a first

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dose of hepatitis B vaccine within 12 hours of life. The remaining doses of hepatitis B vaccine were given at week 6, week 10, and week 14 according to the normal protocol of the Expanded Program on Immunization (EPI). They were summoned for nine months to be tested for HBs antigen.

The parameters studied were

Concerning the mother: socio-demographic data (age, level of education, profession); medical history (jaundice, viral hepatitis B); risk factors for HBV transmission (blood transfusion, surgical intervention, tattooing, non-sterile syringe use, scarification, excision); the mode of delivery and the biological data (viral load).

Regarding the child: sex, gestational age, birth weight, biological data (HBs Ag). The blood samples were sent to the Institut Pasteur in Côte d'Ivoire and to the CEDRES of the University Hospital of Treichville. The viral markers were detected on serum with the ELISA GENERAL BIOLOGICALS EIA® test kit. The data were entered on Excel 2013 and analyzed on SPSS 18. The statistical analysis was done at the α threshold of 0.05 by Fisher's exact test.

RESULTS

Seroprevalence of viral hepatitis B in parturients

During the study period 4401 parturients were admitted to the delivery room and 4222 women were screened, giving an acceptability rate of HBV of 96%. Among pregnant women who accepted the screening test, 231 pregnant women were carriers of HBsAg antigen, an overall frequency of 5.4%.

Table I Sociodemographic characteristics of mothers and risk factors for contamination mothers

Sociodemographic characteristics of mothers and risk factors for contamination mothers	Parturientes (n= 159) Effectif	Percentage (%)
Age group (years)		
≤ 18	03	1,9
19-25	18	11,3
26-35	126	79,2
>36	12	7,5
Professional status		
Frame	11	6,9
Student	4	2,5
Household	79	49,7
Informal sector	65	40,9
Marital status		
Single	60	38
concubinage	89	56
Married	10	6
Vaccination against HBV		
Yes	0	0
No	159	100
Risk Factors for Contamination of HBV Infection		
Sharing a toilet object	67	42,1
Sharing personal object	63	39,6
Surgical intervention	63	39,6
caesarean	35	22
excision	24	15,1
Scarification	21	13,2
Tattoo	14	8,8
Blood transfusion	10	6,3
Dental care	01	0,6
Viral load of mothers (IU / ml)		
≤ 10 ⁶	88	55,3
>10 ⁶	10	6,2
Not arrived	61	38,3

Sociodemographic characteristics of mothers

The average age of mothers was 29 years old with extremes ranging from 18-39 years old. Most of the mothers were in the informal sector (49.7%) and 62.2% of them were out of school. No mothers had been vaccinated against HBV and 42.2% had a history of surgery. Table I describes the socio-demographic characteristics of mothers and their risk factors for hepatitis B.

Table II characteristics of newborns

Characteristics of newborns	AgHBs négative n= 78	AgHBs positive n=20	P
Gestational age			
Prematurity	5 (6,4%)	3 (15%)	0,221
Term	73 (85%)	17 (85%)	
Mode of delivery			
Low way	56 (71,8%)	15 (75%)	0,775
Caesarean	22 (28,2%)	5 (25%)	
Sex			
F	35 (45%)	10 (50%)	0,681
M	43 (55%)	10 (50%)	
Trophicity			
Normotrophie	62 (79,5%)	10 (50%)	0,008
Hypotrophy	16 (20,5%)	10 (50%)	
Viral load of the mother			
≤1000000	73 (93,6%)	15 (75%)	0,014
≥1000000	5 (6,4%)	5 (25%)	

Vertical transmission of HBV

Two hundred and thirty-one (231) mother-child pairs were selected for the study of maternal-fetal transmission of HBV. The prevalence of HBs antigen in mothers was 5.4%. HBsAg was found in the cord blood of 37 neonates of HBV-bearing mothers, with a perinatal transmission incidence of 23.3%. These newborns had a sex ratio of 1.8 and were born vaginally in 70.2% of cases. Their average birth weight was 2900 g with extremes ranging from 1500 g to 3500 g and 29% of them were hypotrophs. Infection with the hepatitis B virus significantly influenced the occurrence of hypotrophy (p = 0.008) and neonates whose mothers had a viral load ≥1000000 were at risk of being infected with the influenza virus. Hepatitis B. Table II describes the characteristics of newborns. For the statistical analysis, 159 mother-child pairs were studied because 72 pregnant women did not have the result of the viral load or were lost to follow-up.

DISCUSSION

The prevalence of HBsAg in pregnant women in our study was 5.4%. Our results are close to those reported in Niger in 2016 (8.4%) [7] in Laos in 2013 (8%) [8] and in Pointe Noire in 2010 (9.6%) [9]. reported in particular in Burkina Faso in 2009 (11.4%) [10], in Mali in 2001 (15.5%) [11] On the other hand, there is a downward trend in Morocco (2.35%) [12], Tunisia (3.8%) [13], and France (0.65%) [14]. These high rates in the countries of sub-Saharan Africa could be explained by the fact that they are part of the highly endemic areas where the prevalence is higher than 8% according to the WHO with a vaccination coverage which is insufficient [15] . The high prevalence of HBsAg in pregnant women is of concern. Because newborns could be infected by their mother at birth (23.3% in our study) but also later during the first or second childhood [16,17]. Pregnant carriers of HBsAg thus constituting an important link in the chain of contamination. Loches *et al* in 1998 found a maternal-fetal transmission of 32.8% higher than ours [6]. A lower frequency has been reported by Sangaré *et al*. in 2009 (4.1%) [18]. These children,

who are thus infected, will for the most part become chronic carriers that will constitute an important reservoir of viruses, thus maintaining hyperendemicity through horizontal and vertical transmission [19]. The risk factor for this mother-to-child transmission identified in this study was the high viral load in the mother ($p = 0.014$). Hence the importance of systematically screening all pregnant women before and especially at the 6th month of pregnancy and if the result was positive, to dose the viral load and put the pregnant woman under antiviral treatment if the viral load was greater than 100,000 IU / L to reduce it. But chemotherapy for viral hepatitis B is inaccessible to the majority of populations, screening for HBV in women, immunization of the mother before or during pregnancy and that of the child in the first twenty-four hours of life. should be a priority in the program for the control of viral hepatitis B.

CONCLUSION

Antenatal transmission of HBV is important at the Cocody CHU. It may reflect a high risk of developing chronic infections and hepatocellular carcinoma in young adults. A health education program targeted at preventing vertical transmission of HBV should accompany the extension of infant immunization coverage.

Conflicts of Interest

The authors state that they have no competing interests.

Authorship

The authors have read and approved the final manuscript.

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How to cite this article:

Kouakou C *et al* (2018) 'Mother Transmission - Child of the Hepatitis b Virus in a Reference Hospital in Ivory Coast', *International Journal of Current Medical And Pharmaceutical Research*, 04(12), pp. 3937-3939.