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Post-immunization evaluation in infants of Hepatitis B carrier mothers

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Abstract

Objective: Although postnatal hepatitis B vaccine and hepatitis B immunoglobulin are administered to infants of hepatitis B carrier mothers, it is recommended that the infants' hepatitis B immunization be evaluated 3-6 months after vaccination. Our aim is to evaluate the immunization levels of infants born to hepatitis B carrier mothers and whose vaccination has been completed.

Methods: In this observational study, the hepatitis B serologies of term infants born to hepatitis B carrier mothers, who were vaccinated and immunoglobulin-treated and vaccinated, and who were followed up in our outpatient clinic between 2015-2017 were evaluated.

Results: A total of 19 babies born to hepatitis B carrier mothers, whose immunization was completed, who came to our clinic for follow-up, with an average gestational age of 39.1 ± 1.2 weeks and a birth weight of 3465 ± 566 grams, were evaluated at an average age of 19.7 ± 7.8 months. 68.4% of the babies (13 babies) were born by cesarean section. The average duration of breastfeeding was 6 ± 3.1 months. Anti-HBs was not observed in 2 of the babies (10.5%). Hepatitis B vaccination was repeated in the cases.

Conclusion: All babies born to hepatitis B carrier mothers, even if they are healthy term babies with completed vaccination, should definitely be evaluated and monitored in terms of immunization, and breastfeeding should not be stopped.

Keywords: Hepatitis B, birth, baby, hepatitis B immunization

Introduction

Hepatitis B is a major global health problem. The World Health Organization estimates that 254 million people will be living with chronic hepatitis B infection in 2022, with 1.2 million new cases of infection occurring each year.[1] Hepatitis B carrier mothers are an important risk factor for hepatitis B infection. Hepatitis B virus is transmitted from mother to baby during and after birth. Immunization is important to reduce the risk of transmission from hepatitis B carrier mothers.[1,2] HBe antigen positivity in hepatitis B carrier mothers increases the risk of transmission and the risk of chronicity in infected babies by up to 90%.[3,4] Administration of hepatitis B vaccine and hepatitis B immunoglobulin to babies after birth reduces this rate to 5-10%.[5,6] Hepatitis B immunoglobulin and hepatitis B vaccine should be administered intramuscularly to babies of HBs antigen-positive mothers within the first 12 hours after birth.[1] Hepatitis B immunization should be evaluated by checking HBsAg and anti-HBs antibodies in babies who are eligible for hepatitis B vaccine and hepatitis B immunoglobulin at 9-12 months.[2,7] Our study aimed to evaluate the immunization levels of babies born to hepatitis B carrier mothers and whose vaccination was completed.

Methods

Term babies who were followed up in our hospital's neonatal clinic between January 2015 and December 2017 were included in the study. Ethics committee approval

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19 babies born to hepatitis B carrier mothers, who were vaccinated with hepatitis B and hepatitis B immunoglobulin after birth and who had completed 3 doses of vaccination were evaluated. HbsAg and antiHbs serology of these babies were examined. HBsAg, antiHBs, HBeAg, HBV DNA and liver function tests in the retrospective hospitalization files of hepatitis B carrier mothers were examined.

Statistical evaluation of the data was performed using the "SPSS (Statistical Package for Social Sciences) 15.0 for Windows" program. Data were presented as minimum, maximum and mean ± standard deviation.

Results

19 babies were included in the study. When the demographic characteristics of the babies were examined, the mean gestational age was 39.1±1.2 (37-40) weeks, and the mean birth weight was 3465±566 (2600-3900) grams. The mean maternal age was 28.7±5.1 (19-33) years. 12 (63.1%) of the babies were male, 7 (36.9%) were female. 13 (68.4%) of the babies were born by cesarean section, and 6 (31.6%) were born vaginally.

Of the HbsAg positive mothers, 1 was HBeAg positive, 2 were HBV DNA positive (3*1000000 IU/ml), and 1 had abnormal liver function tests (AST:81U/L, ALT:47 U/L).

Hepatitis serology was evaluated when the infants were 19.7±7.8 (10-24) months old on average. The average duration of breastfeeding was 6±3.1 (2-14) months. HBsAg was negative in all infants. Anti-HBs was not observed in 2 infants (10.5%). Hepatitis B vaccination was repeated in the cases.

Table 1. Demographic Characteristics of the Study Group

Number of cases	19
Gestational age (weeks)*	39.1 ± 1.2 (37-40)
Birth weight (grams)*	3465 ± 566 (2600-3900)
Delivery type (Normal/C-section)	6/13
Maternal age (years)*	28.7 ± 5.1 (19-33)
Follow-up period (months)*	19.7 ± 7.8 (10-24)
Duration of breastfeeding (months)*	6 ± 3.1 (2-14)
Post-vaccination immunization, n (%)	17 (89.5)

* Values are given as mean ± standard deviation.

Discussion

Hepatitis B infection is a widespread and important public health problem in the world. The World Health Organization estimates that 254 million people will be living with chronic hepatitis B infection in 2022, and 1.2 million new cases of infection will occur each year.[1] Approximately 65 million of this population are estimated to be women of childbearing age. Women of childbearing age infected with hepatitis B virus (HBV) constitute a very important group for the spread of this virus. The highest prevalence of hepatitis B infection among women of childbearing age is seen in the Western Pacific and Africa region.[1,8] The frequency of hepatitis B infection in pregnant women is the same as in the general population. The HBsAg seropositivity rate in pregnancy is between 0.6% and 5.8% worldwide. This rate is close to 20% in endemic regions.[9-11] In our country, the HBsAg rate in pregnant women was found to be around 1.20% and 4.7%.[12-14] Babies born to HBsAg positive mothers may be carriers of chronic hepatitis B in 65% to 90% of cases when they are not treated. These babies are at risk of chronic hepatitis and hepatocellular cancer in their later years.[1,3]

HBV transmission from mother to baby can occur in the intrauterine period, during birth or in the postnatal period. HBV transmission from mother to baby occurs most frequently during birth. Especially premature membrane rupture, risk of premature birth, early separation of the placenta, and contact with the mother's vaginal secretions increase the risk of transmission.[2] In order to reduce the risk of hepatitis B transmission, it is recommended that pregnant women be screened for HBsAg, those who are positive should be monitored with advanced tests, and babies born to HBsAg positive mothers should be vaccinated with Hepatitis B vaccine and Hepatitis B immunoglobulin immediately after birth. HBsAg screening should definitely be performed in the first trimester. If HBsAg and Anti-HBs are negative, it is recommended that the pregnant woman be vaccinated with Hepatitis B vaccine. If HBsAg is detected positive, HBeAg, anti-HBe, HBV DNA and liver function tests should be checked.[15] HBV DNA level is an important indicator of transmission from mother to baby. It has been shown that maternal HBV DNA level is the strongest predictor of infant immunization failure. Recent studies have shown that maternal HBV DNA level >5.2 logIU/ml (6 log 10 copies/ml) is the most important predictor of transmission to the infant and infant immunization failure.[16,17] In addition to immunoprophylaxis, antiretroviral Tenofovir treatment is recommended in the third trimester to reduce perinatal transmission in mothers with HBV levels >200,000 IU/ml

(>5.3 log 10 IU/ml).[15]

In our study, two mothers had high HBV viral loads; however, it was observed that there was no transmission to the babies of these mothers and both babies were AntiHBs positive after immunoprophylaxis. This shows the importance of active and passive immunization applied immediately after birth in mothers with high HBV viral levels.

The mother being HBeAg positive is another important risk factor for transmission.[5,6] If immunoprophylaxis is not applied to a baby born to an HBeAg positive mother, the probability of developing chronic hepatitis B is 70-90%, while this rate is below 10% in babies born to HBeAg negative mothers.[15] The ALT level of the mother's liver function test is important for the mother's health; it is used for the mother's treatment indication.[15] In our study, HBeAg was detected positive in one mother, but her HBV viral load was negative. It was observed that the baby of this mother was also anti-HBs positive after active and passive immunization.

HBsAg positive mothers can breastfeed their babies who have received the first dose of hepatitis B immunoglobulin and hepatitis B vaccine at birth; however, it is important for the baby to complete their hepatitis B vaccine doses. Breastfeeding mothers should be careful to prevent bleeding from cracked nipples.[9,18] In our study, all babies were breastfed, and the mean duration of breastfeeding was 6 ± 3.1 months.

In our study, only two of the babies who received active and passive immunization was found to be Anti-HBs negative, and the immunization was repeated. All other babies were Anti-HBs positive.

Conclusion

As a result, all babies born to hepatitis B carrier mothers should be given hepatitis B Immunoglobulin and hepatitis B vaccine immediately after birth, and hepatitis B serology should be evaluated at 9-15 months after the baby's hepatitis B vaccine doses are completed.

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