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Hepatitis B Prevalence in Pregnant Women at Maharaj Nakorn Chiang Mai Hospital.

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ABSTRACT

Objective To determine the prevalence of hepatitis B carrier in pregnant women and the percentage of newborn immunoprophylaxis.

Study Design Descriptive cross-sectional study.

Subject Six hundred and eighty Thai pregnant women attending ANC between November 1, 1997 and January 31, 1998 with gestational age not more than 35 weeks were recruited into the study.

Material and Method After informed consent, 5 ml of each patient's blood was drawn and then tested for both HBs and HBe antigen with the IMx, HBsAg and HBe 2 assays (the third generation Microparticle Enzyme Immunoassay, Abbott Laboratories USA). The patients were then informed of the result within 1 week.

Main measures The prevalence of HBs and HBe antigen including percentage of newborns with HBV immunoprophylaxis .

Result There were 52 HBs Ag carrier mothers with only 19 positive HBe Ag (36.5%). In this population, the prevalence of HBs and HBe Ag carrier were 7.6 % and 2.79 % respectively. The positive rate of HBs Ag is the highest in 21-30 year-old maternal age groups(5.29%). For newborn immunoprophylaxis, all were given HBV vaccination but only 26 out of 52 (50%) received immunoglobulin whereas 23 did not receive any. For the three remainders, two were delivered at other hospitals , the other was hydrops fetalis.

Conclusion The prevalence of hepatitis B carrier mother in this study is 7.6 % the same as the previous studies. The immunoprophylaxis efficacy of vaccination alone comparing with immunoglobulin plus vaccination needs further study.

Keywords: hepatitis B, pregnant women

Introduction

The prevalence of hepatitis B, one of the well known predisposing factors for cirrhosis and hepatocellular carcinoma, is very high in Asian countries.[1,2] In Thailand, there are 8-10 % or 6 million of HBV carriers mostly in reproductive adolescent populations.[3,4] The perinatal HBV transferring from carrier mother to baby is the major mode of transmission responsible for 34-37 % or 30,000 newborns each year.[5,6]

Hepatitis B encoded antigen (HBe Ag) is another factor of carrier mother carrying a greater risk of perinatal transmission. HBs Ag seropositive alone is responsible for 10-25 % comparing with 76-84 % in both positive HBs and HBe Ag mother.[5,6] The 80-90 % neonates of such mothers become chronic HBV carriers within 6 months. One fourth of them will develop cirrhosis or primary liver cancer in the future.[7] This world health problem required a large sum of money, equipment and medical persons to solve. The strategy for controlling and prevention hepatitis B is in the adoption of universal newborns hepatitis B vaccination.

In Chiang Mai, hepatitis B carrier screening test is not routinely done at antenatal clinic (ANC) for many years. This research is to find out the prevalence of hepatitis B carrier in pregnant women to be used as the basic data for our patients. We also determine the percentage of newborn with HBV immunoprophylaxis after delivery.

Materials and Methods.

Study Population.

680 Thai pregnant women attending ANC of Maharaj Nakorn Chiang Mai hospital between November 1, 1997 and January 31, 1998 with gestational age not more than 35 weeks were recruited into the study prospectively.

Study Design .

After informed consent, 5 ml of each patient's blood was collected and screened for both HBs and HBe antigen. The patients were then informed of the result within 1 week. All live birth newborns were given hepatitis B vaccination. For neonates of HBs with or without HBe Ag positive mothers were encouraged to receive hepatitis B immunoglobulin (HBIG) after delivery if possible.

Laboratory Analysis.

Each blood sample was tested with the commercial test kits (IMx HBsAg and HBe2 assays, Abbott Laboratories, USA) The biological principle is based on the third generation Microparticle Enzyme Immunoassay technology. Both assays are qualitative tests. The specimens are determined to be reactive or non-reactive based only on the S/N result (a ratio of the sample rate to the MODE 1 Calibrator rate). The cutoff point was set at S/N $\geq$ 2.000 and 2.100 for HBsAg and HBe2 assays respectively. The accuracy of these two tests are approved by FDA. IMx HBsAg assay ranged from 0.2 to 0.5 ng/ml for the sensitivity result where as endpoint sensitivity titers in HBe2 assay is 1:2048.

Immunoprophylaxis solutions

Following the Ministry of Health's policy, all live birth newborns will be given the recombinant DNA hepatitis B vaccine 10 microgram/0.5 ml intramuscularly at 0,1,6 months. Neonates of HBs positive mothers were encouraged to receive 100 IU/0.5 ml of hepatitis B immunoglobulin (HBIG) intramuscularly within 24 hours after delivery at the opposite limbs. It costs about 800 to 1,000 Baht each. Unfortunately, since this April HBIG was not available anywhere in Thailand. The infants delivered from HBV carrier mother after this period received only HBV vaccine without any HBIG

Statistical Analysis

The number of HBs and HBe Ag seropositive mothers were analyzed for the prevalence. The percentage of newborns with HBV immunoprophylaxis was also determined.

Table 1. General population data

Data	Results	Percentage
Mean age ± SD	26.71± 5.05	
Occupation	employee	63.5
	housewife	14.6
	agriculture	10.1
Residence	Chiang Mai	87.5
	Lumpoon	10.6
	others	1.9
GA	first trimester	13.5
	second trimester	47.4
	third trimester	44.2
	unknown	1.3
Parity	nulliparous	40.6
	multiparous	59.4
Anti-HIV	positive 0.1	
	negative	85.9
	unknown	14.0
Previous blood transfusion within 3 months	yes	96.8
	no	3.2

Table 2. Liver function tests of hepatitis B carrier mothers*

LFT	Normal (%)	Abnormal (%)
GOT	33 (97.1)	1 (2.9)**
GPT	31 (91.2)	3 (8)**
ALP	34 (100)	0

* Only 34 of hepatitis B carrier mothers were tested for liver function test

** All of them were HBe Ag positive

Table 3. The prevalence rate of hepatitis B surface antigen and hepatis B encoded antigen by maternal ages group

Age group	HBsAg (%)	HBeAg (%)
14-20	5 (0.74)	1 (0.15)
21-30	36 (5.29)	17 (2.50)
31-40	11 (1.62)	1 (0.15)
Total	52 (7.60)	19 (2.79)

Table 4. Fetal outcomes of hepatitis B carrier mothers*

Fetal Outcome	Results
Mean GA (wk) ± SD	37.7± 5.72
Mode of delivery	
Normal	41 (82 %)
C/S	3 (6 %)
Breech assisting	1 (2 %)
F/E, V/E	5 (10 %)
Sex	
Male	22 (44 %)
Female	27 (54 %)
Hydrops fetalis	1 (2 %)
Birthweight (g) ± SD	2825.2 ± 617.46

(* Only 50 fetal outcomes were showed, the 2 remainders were deliverd at other hospitals)

Results

The details of population data are shown in table 1. It was found that 52 of 680 pregnant women (7.6%) were HBs Ag positive. Nineteen out of the 52 (36.5%) were positive both for HBs and HBe Ag. Liver function test (LFT) was performed in 34 HBV carriers as shown in table 2. Most of them were normal. Only 3 of HBe Ag positive mothers had slightly rising of GPT without any clinical symptoms.

It showed that the over-all prevalence of HBs and HBe antigen carrier were 7.6 % and 2.79 % respectively. With regard to the maternal age, the prevalence rate of HBs Ag was 0.74%, 5.29% and 1.62% respectively at the age of 14-20, 21-30 and 31-40 years (table 3).

Newborn Immunoprophylaxis

Passive Immunization

With regard to the 52 infants with HBV carrier mother, only 26 (50%) were given the immunoglobulin after birth. Ten of these were the infants of mothers with HBs and HBe Ag positive. For the remainders, 23 did not receive HBIG due to unavailable drugs, two were delivered at other hospitals the other was hydrops fetalis.

Active immunization

All infants were given HBV vaccine due to the universal hepatitis B vaccination program adopted by the Ministry of Health throughout the country since 1992.

Fetal outcome

The details of fetal outcome are shown in table 4.

Discussion

This study has shown that the over-all prevalence rate of HBs Ag in pregnant women was as high as the other Asian countries (7.6 % VS 5-14 %).[8-9] The positive rate of HBs Ag was maximum in 21-30 year-old maternal group with 5.29 % and 32.69 % of HBe Ag positive rate.

We have just started the HBs Ag screening program for all attending pregnant women by using Reverse Passive Hemagglutination (RPHA) technique since April 1998. It costs less than ELISA technique but with slightly lower sensitvity.

Following the Ministry of Health's policy, all newborns will be given HBV vaccine for immunoprophylaxis. In addition, the infants of HBs Ag positive mother should receive HBIG if possible.

Instead of 100% prophylaxis there was only 50 % of such newborns received both HBV vaccine and HBIG in this study. HBIG became unavailable in Thailand since April 1998. However, there are many reports showed that the long term protective effect of HVB vaccine alone comparing with vaccination plus HBIG in the neonates of HBs Ag and HBe Ag positive mother appears to be the same.[10-14] In addition, the follow-up data such as chronic HBV carrier rate, the protective efficacy of vaccine alone comparing with immunoglobulin plus vaccination in such neonates warrant further study.

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