

Hepatitis B Antigen and Antibody In Umbilical Cord Blood

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OBJECTIVE: This is a study of the prevalence of hepatitis B antigen (HBsAg) and antibody (anti-HBs) in the sera of women in labor and in umbilical cord blood.

BACKGROUND: Other studies conducted at SMRL have show that hepatitis B virus (HBV) frequently infects residents of Bangkok at an early age. It is possible that some people are infected during the prenatal period. If so, a prenatal infection might be detrimental to the health of the newborn. In this study the results of hepatitis B serology were compared with demographic information collected by interview, serum biochemical tests, and IgM concentration in the cord blood.

DESCRIPTION: From 17 July 1972 to 15 June 1973, women in labor were interviewed in Women's Hospital, Bangkok. At the time of delivery 10 ml of whole blood was drawn from the mother and from the umbilical cord. Serum was used for all tests.

HBsAg was detected by IEOP, CF and RIA. Anti-HBs was detected by IEOP. SGOT and SGPT determinations were made by the Department of Biochemistry, SMRL. Total IgM concentration of umbilical cord serum was determined by radial immunodiffusion (Hyland Lab).

PROGRESS: A total of 1625 pairs of maternal and umbilical cord sera were tested. HBsAg was detected in 93 (5.7%) of the mothers and 10 (0.6%) of the cord sera by RIA. Antigen was never found in the cord serum of an infant whose mother was negative.

Anti-HBs was found in 137 (8.4%) of the mothers and 137 (8.4%) of the cord sera. Although 137 sera were antibody positive by IEOP, none was positive by CF. In every instance when antibody was found in the cord blood, it was also present in the mother; however, the concentration of antibody in the maternal serum was often so low that the serum had to be concentrated about 10 times with polyacrylamide gel (Lyphogel) in order to get a precipitin reaction comparable to that of the cord blood.

For evaluating the interview data, all of the mothers with HBsAg and anti-HBs were compared to 138 negative mothers. Mothers were grouped by their number of pregnancies to see if HBV infection might affect early or late pregnancies differently. The data did not show any relationship between HBsAg or anti-HBs and the age of mother, number of pregnancies, birthweight of last child, number of surviving children, number of people living at home or the reported family income. It was found that, on the basis of small numbers, multigravidas with a history of abortion were more likely to have antigen in their cord blood than mothers without a history of abortion.

There was no difference in the level of SGOT or SGPT between antigen positive and negative sera (Table 1). In 11 pairs of sera where both the maternal and cord blood contained HBsAg, the values of SGOT and SGPT correlated very closely. Similarly, determinations of IgM concentrations in cord sera did not differentiate between antigen positive, antibody positive and negative mothers (Table 2).

A prospective study of HBV infection in infants during the first year of life is underway.

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Table 1. Transaminase Levels in Maternal and Umbilical Cord Sera

Mother	Maternal Serum			Cord Serum		
	No.	SGOT	SGPT	No.	SGOT	SGPT
HBsAg	93	27.3 ± 10.3*	20.2 ± 7.7	90	32.0 ± 11.4	17.4 ± 5.8
Anti-HBs	135	25.4 ± 13.1	18.9 ± 8.4	133	32.1 ± 12.3	16.6 ± 7.0
Negative	138	25.2 ± 13.6	20.0 ± 15.8	136	29.2 ± 9.2	16.3 ± 5.1

* Mean ± one standard deviation

Table 2. Concentration of IgM in Umbilical Cord Sera

Mother	Umbilical Cord IgM			
	No.	Mean (mg%)	Standard deviation	Range
HBsAg	38	6.8	2.8	0-15
Anti-HBs	7	6.5	4.3	0-12.8
Negative	74	6.7	3.3	0-17.1
Normal Thai (1)	7	6	4	2-10

REFERENCE :

1. Thongcharoen, P. et al: Determination of Human Serum Immunoglobulins in Healthy Thai Subjects. J. Med. Ass. Thailand. 55:347-355, 1972.