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THIS ISSUE

PERINATAL HEPATITIS B PREVENTION

This issue updates information and recommendations on efforts in Connecticut to eliminate perinatal transmission of hepatitis B.

FAILURE TO PREVENT PERINATAL TRANSMISSION

Recently, two cases of preventable perinatal hepatitis B virus transmission were reported to the Connecticut Department of Public Health (DPH). These cases involved infants born in Connecticut hospitals.

Case #1

The child in this case was born to a non-English speaking Asian woman who received prenatal care initially at a hospital clinic. Early in her pregnancy, she tested positive for HBsAg on two occasions and negative for HBsAb. Clinic personnel could only communicate with the patient through an interpreter. Neither the laboratory nor the physician reported her HBsAg positivity to state or local health departments.

During her second trimester, she switched to a private medical office for the remainder of her prenatal care. The laboratory results and prenatal record were forwarded from the hospital clinic. In transcribing the results obtained from the clinic into the new prenatal record, the negative HBsAb result was entered into the HBsAg space. Other office personnel failed to detect the error.

Hospital birth records for the mother and child contained only the information from the second prenatal record. The newborn did not receive either HBIG or dose 1 of hepatitis B vaccine while in the hospital. The hospital policy on vaccination of newborns was to leave the decision to the discretion of the pediatrician. The attending pediatrician did not administer the vaccine because the mother was unable to speak English well enough to give informed consent. Hepatitis B vaccine doses were administered at 2, 4 and 6 months of age. The child was tested during the mother's subsequent pregnancy and found to be a carrier of HBsAg.

Case #2

The child in this case was born to a known intravenous drug user who entered prenatal care at a hospital clinic. She was tested appropriately and found to be positive for both HBsAg and HBsAb. Her laboratory results were reported to the state and local health departments. She was referred to a second hospital for treatment of substance abuse. The second hospital requested and received the prenatal record and laboratory results from the first hospital. The second hospital repeated the HBsAb test but not the HBsAg test. The laboratory results from the first hospital were overlooked.

The pediatricians attending the newborn noted the positive HBsAb result and did not administer HBIG. Dose 1 of the vaccine was given between 24 and 48 hours after birth. Additional doses were given at 2 and 10 months of age. The child was found to be HBsAg positive as a result of post-vaccination testing.

An attempt was made by the local health department to contact the patient after the initial HBsAg result was reported. When the woman changed her residence to a different town, information about the case was not successfully forwarded to the new health department.

EDITORIAL NOTE: Transmission of hepatitis B virus (HBV) from mother to newborn is very efficient. Up to 90% of infants born to HBsAg carrier mothers are infected at birth if not treated promptly with HBIG and vaccine. Of infected newborns, 90% become lifelong carriers of hepatitis B with high risk of eventually developing fatal liver disease.

Administration of HBIG and dose 1 of vaccine (high risk formulation) within 12 hours of birth, followed by dose 2 at 1 month and dose 3 at 6 months of age will prevent more than 90% of perinatal infections. Routine hepatitis B immunization alone can prevent more than 70% of perinatal infections if the first dose is given immediately after birth and the second and third doses are given at 1-2 and 6 months.

Prevention of perinatal hepatitis B requires on-going communication between providers and the patient throughout her pregnancy and until the newborn completes the vaccine series. The process is complicated by the involvement of multiple physicians who may rarely see pregnant HBsAg carriers in their practices. In the two cases described above, successful use of alternate channels of information transfer might have prevented both infections.

RECOMMENDATIONS FOR PRENATAL CARE PROVIDERS

The following recommendations, based on both national and Connecticut experience, are designed to minimize the potential for perinatal transmission of hepatitis B:

1. All pregnant women should be tested for HBsAg at an early prenatal visit regardless of physician assessment of the woman's likelihood of being infected. Re-testing should be done during all subsequent pregnancies. HBsAg positivity should be highlighted in all records.

2. Prenatal care providers should verify that positive test results are successfully transferred to the hospital newborn nursery, the pediatrician, and the obstetrical service.

3. Appropriate office personnel should be trained to accurately interpret laboratory results.

4. The pregnant carrier should understand the implications of her test results and be able to communicate them to hospital personnel and to her pediatrician.

5. Pregnant HBsAg carriers should be reported to the state and local health departments as soon as their status is known.

RECOMMENDATIONS FOR HOSPITALS

Hospitals should have a written perinatal hepatitis B prevention policy incorporating the following:

1. All pregnant women admitted for delivery must have a HBsAg test result and date in their medical record. Where records are unavailable, women should be tested. The results should be available within 12 hours of birth.

2. Newborns of HBsAg-carrier mothers should receive HBIG and dose 1 of the vaccine as soon as possible but within 12 hours of birth. Administration of vaccine should be well documented. A "high-risk" formulation of vaccine should be used (Table 1).

3. To minimize the transmission of HBV from unidentified pregnant HBsAg carriers (Case#2), all newborns should receive the first dose of vaccine within 24 hours of birth.

4. A pediatrician should be identified and an appointment date made for **all** newborns before discharge. Information about maternal HBsAg and initial hepatitis B vaccination status should be transferred to the pediatrician before the appointment date.

RECOMMENDATIONS FOR PEDIATRIC PROVIDERS

1. Maternal HBsAg results and newborn vaccination status should be obtained before the first well-child visit.

2. Newborns of HBsAg-carrier mothers must adhere to the 0,1 and 6 month schedule. **When multiple vaccinations at the same visit become a problem, hepatitis B vaccine should take precedence over all other vaccinations. Vaccine should not be delayed for minor illness.**

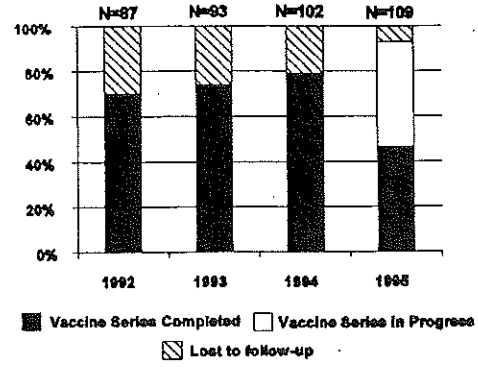
3. Infants of HBsAg-carrier mothers should receive a high-risk formulation of vaccine (Table 1).

4. Infants of carrier mothers should be tested (HBsAg, HBsAb) at one year of age to confirm that they are successfully immunized and that they have not been infected.

Interpretation of Laboratory Results

HBsAg	Hepatitis B surface antigen - Indicates the presence of hepatitis B virus, the patient is infectious to others.
HBsAb	Hepatitis B surface antibody - Indicates previous infection or vaccination. 20-40% of carriers are both HBsAg and HBsAb positive.
HBcAb	Hepatitis B core antibody - Indicates previous infection.
HBeAg	Hepatitis B e antigen - Indicates high titers of virus in the blood.

Figure 1. Hepatitis B vaccination of infants born to HBsAg-positive women, Connecticut, 1992-1995



THE PERINATAL HEPATITIS B PREVENTION PROGRAM

DPH has conducted confidential case-management of infants and household members of pregnant carriers since 1992. Program objectives include: a) ensuring that all pregnant women get tested for HBsAg; b) ensuring that all infants of pregnant carriers are vaccinated appropriately; and, c) offering free testing and vaccination to all household and sexual contacts of pregnant carriers.

A recent expansion of the program has allowed DPH to hire a nurse who manages cases residing in Hartford, New Haven, and Fairfield Counties. The nurse's duties include education of the mother, arranging for testing and vaccination of contacts, arranging for translators, and forwarding information and correct vaccine to the appropriate physicians.

The program has managed 391 infants born to pregnant HBsAg carriers since 1992. Timeliness and completeness of efforts to prevent perinatal transmission of hepatitis B have markedly improved since the inception of the Program. It is now unusual for a pregnant HBsAg carrier or her infant to be lost to public health follow-up (Figure 1).

Questions about hepatitis B? call Aaron Roome, PhD, MPH or Monica Rak, RN at (860) 566-5058.

Table 1. Recommended Dosages of Hepatitis B Vaccine

Hepatitis B Virus Risk Status of the Infant or Age of the Vaccine Recipient	VaccineTimeliness				
	Engerix-B® (SmthKline Beecham)		Recombivax HB® (Merck & Co.)		
	Pediatric Formulation	Adult Formulation	Pediatric Formulation	High-Risk Infant or Adolescent Dose	Adult Formulation
	Blue Cap 10μg/ml	Orange Cap 20μg/1.0ml	Brown Cap 2.5μg/0.5ml	Yellow Cap 5μg/0.5ml	Green Cap 10μg/1.0ml
Infants born to HBsAg positive mothers or if mother's HBsAg status is unknown	10μg (0.5ml)			5μg (0.5ml)	
Infants born to HBsAg negative mothers	10μg Vaccine Brand		2.5μg (0.5mSmithKline		
1-10 year olds	10μg (0.5ml)		2.5μg (0.5ml)		
11-19 year olds	10μg (0.5ml)			5μg (0.5ml)	
20 + year olds		20μg (1.0ml)			10μg (1.0ml)

Note: Select the appropriate dose of vaccine based on the number of micrograms(μg) you wish to administer. Do not select the dose based on a volume alone because a 0.5 ml volume may contain 2.5μg, or 5μg, or 10μg of vaccine antigen, depending on which vial you choose. Different vials contain different concentrations of vaccine (reprinted from the Hepatitis B Coalition).

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