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HEPATITIS B UPDATE

In recent years, several initiatives have been undertaken with the goal of eliminating transmission of hepatitis B virus (HBV) in the United States (1). Most prominent have been recommendations for universal testing of pregnant women for hepatitis B surface antigen (HBsAg), immunization of all newborns against HBV infection, and intensified public health follow-up of HBsAg carrier pregnant women.

HOSPITAL SURVEY

In early 1993, a study was performed in collaboration with a group of Yale MPH students to examine compliance with recommendations for screening all pregnant woman during prenatal care or at admission for delivery, and immunization of all newborns before they leave the hospital (2). A sample of women who delivered during January 1 - February 15, 1993, was selected from the birth log of each of the seven hospitals with obstetric services in Bridgeport, Hartford, and New Haven: 80 women were selected from each hospital. Charts of each mother and her infant were reviewed for evidence of maternal HBsAg screening and selected maternal risk factors for prior HBV infection, for evidence of newborn vaccination and for whether screening or vaccination information was recorded in the discharge summary. Of the 560 selected births, charts were available and reviewed for 538 (96%) mothers, 529 (94%) infants, and 515 (92%) mother-infant pairs.

HBsAg Screening. Documentation of maternal HBsAg screening was present in 484 (90%) maternal records (range by hospital: 86%-99%), 344 (65%) infant charts, and 112 (29%) of the 385 infant discharge summaries included in the infant's charts. Women with evidence of prenatal care were more likely to have screening results (92%) than those lacking evidence of prenatal care (74%) (Table 1). Screening was not associated with maternal risk factors for prior HBV infection.

Infant vaccination. Overall, 384 (72.6%) infants received a dose of hepatitis B (HB) vaccine before hospital discharge. Vaccine coverage differed substantively by hospital (range 40%-96%, $p < 0.001$). In two hospitals, vaccine was routinely offered to all newborns, both public-sector (infants on Medicaid and/or scheduled to attend public clinics for well-child visits) and private. In the other five hospitals, vaccine was routinely offered only to newborns with public-sector coverage. Private attendings were responsible for the decision to offer vaccine to newborns under their care. In these latter hospitals, vaccine coverage was lower among both public-sector and private-sector infants than it was in the two hospitals offering vaccine to all newborns (87% vs 96%, respectively, for public-sector infants ($p < 0.05$); 48% vs 95%, respectively, for private-sector infants ($p < 0.001$). Thirty infants were born to mothers who were unscreened for HBsAg but at high risk for HBV carriage. Only 16 (53%) of these newborns were vaccinated in the hospital.

Discharge summaries are often the only portion of the infant's hospital medical record taken

Table 1. Factors associated with lack of maternal hepatitis B screening, Connecticut, 1993.

Factor	Total	Not Screened No.	(%)	relative risk	(95%CI*)
Prenatal care					
No+	61	16	26	3.4	(2.0-5.7)
Yes	477	37	8	Referent	
City resident					
No	335	41	12	2.2	(1.2-4.2)
Yes	198	11	6	Referent	

* Confidence interval
\+ No mention in mother's chart

to the outpatient office or clinic. Summaries were present in 385 (74%) of the 529 infant charts. Information on whether HB vaccine was given was present in only 35% of discharge summaries (42% of records of vaccinated infants vs 12% of records of unvaccinated infants). Information on maternal HBsAg status was present in only 30%.

Editorial Note: While the findings of the study were very encouraging, there was considerable variation between hospitals in current policies and practices and several areas where there was potential for improvement.

HBsAg Screening. Although the study demonstrated that prenatal screening for HBsAg has become a standard practice in Connecticut, there was little evidence that women admitted for delivery with unknown HBsAg status were being systematically screened. Women who are admitted without an HBsAg result in the record should be tested.

Approximately 50% of all HBsAg carrier women do not fall into classical risk categories for HBV exposure. Test results should be available to the neonatologist within 48 hours of admission. The infant should not be discharged until maternal HBsAg status is known so that post-exposure prophylaxis can be initiated if the mother is HBsAg-positive. In some states and in some Connecticut hospitals, discharge is delayed until maternal HBsAg status is known.

Recording of maternal HBsAg status in the infant medical record and in the infant discharge summary was poor, 65% and 30% respectively. Because dose and timing of the newborn HB vaccine series is dependent on maternal HBsAg status, this information must be available to the newborn's neonatologist and the subsequent well-child care provider. Systems are needed to ensure that this essential information is not just obtained, but transferred to the relevant providers.

Infant Vaccination. Beginning infant HB vaccination in the hospital offers several advantages over beginning it later: (a) in the event that a HBsAg positive mother was not screened, the risk of perinatal HBV transmission will be reduced; (b) the number of injections needed during well-baby visits is reduced; and (c) the chances will be increased for maximum protection during the first year of life when the risk of chronic HBV infection is greatest.

While all hospitals in the study had policies to routinely offer vaccine to at least some infants (public-sector), vaccination rates of these infants were highest in those hospitals in which the neonatology unit took responsibility for vaccination of all newborns. In the absence of a policy to vaccinate all newborns, nearly 50% of infants born to unscreened, high-risk mothers were unvaccinated.

Based on recent communications from the CDC (3), failure to prevent perinatal HBV transmission can pose a legal liability risk to both the physician and the hospital. In contrast, there have been no successful lawsuits against physicians giving required vaccines and following standard practices since 1977.

As with maternal HBsAg test results, it is critical to subsequent vaccine dosage and timing for the well child care provider to know whether HB vaccination was given in hospital. This study shows that the discharge summary is currently an ineffective vehicle for such information exchange. Hospitals and outpatient providers need to develop effective mechanisms to ensure that

essential information is transferred in a timely manner. At the time of the study, several alternative methods were being attempted by some of the study hospitals. These included keeping a log on the newborn unit of newborns who received vaccine in order to be able to readily answer inquiries, sending out a brief special discharge summary form with the 2-week PKU test kit, and completing the parent-held immunization record.

NEW REQUIREMENTS FOR HEPATITIS B VACCINATION FOR DAYCARE AND SCHOOL

Children born January 1, 1994 or later will soon be required to be age-appropriately vaccinated against HBV to enter licensed daycare and school in Connecticut. Section 19a-7f of the state statutes requires that immunization requirements for daycare and school entry be tied to current national recommendations. Although the national recommendations for universal HB vaccination were issued in November 1991 and February 1992 by the ACIP and AAP, respectively, and the state Immunization Program provides free vaccine for any child born January 1, 1993 or later, the state Immunization Advisory Council recommended that at least one year leeway be given to physicians to incorporate HB vaccination into routine practice before requiring it.

For purpose of day care entry, age-appropriate vaccination against HBV will be defined according to the most lenient of the national recommendations and an additional one month leeway will be given for children to get the recommended dose of vaccine. Correspondingly, children aged 3-6 months will be required to have one dose of vaccine; those aged 7-18 months must have had two doses; and those 19 months or older must have had three doses. Enforcement of day care entry requirements is likely to begin early in 1995.

PERINATAL HEPATITIS B PREVENTION

The Epidemiology Program in conjunction with local health departments conducts follow-up on all HBsAg-positive pregnant women to assure that they are educated about HBV infection, and that their infants and household/sexual contacts are appropriately immunized. Since most of these services are beyond the scope of services provided by most office or clinic providers, physicians are urged to notify the Epidemiology Program about any pregnant carriers they identify. Vaccine and testing are free for all newborn, household and sexual contacts of HBsAg-positive pregnant women.

The Epidemiology Program has identified 374 HBsAg-positive pregnant women since 1992. Although many of the families identified by the Program have language and economic barriers to immunization, approximately 75% of the high-risk infants identified are known to eventually complete the series. Importantly, as many as 50% have at least one dose given significantly off the recommended vaccine schedule.

INADEQUATE HEPATITIS B VACCINE RESPONSE IN ADULTS

Two studies were recently published which examined the response rate to HB vaccination and predictors of non-response in adults (4, 5). One of these studies was carried out by the Epidemiology Program among fire fighters in Connecticut (4). Of 528 vaccinated subjects tested within 6 months of their last dose of a standard 3 dose series, 88% were found to have protective levels of antibody. Risk factors for inadequate response included age > 40 years, current or past history of smoking, extreme obesity, and being tested longer than 3 months after completion of vaccination. The response rate in persons with none of these factors was 95%. In persons with two or more risk factors for poor response, the response rate ranged from 40% to 85% depending on individual characteristics.

Editorial Note: Routine post-vaccination testing for HBV is generally not recommended (1). However, for persons who have definable risk factors for an inadequate response and a significant ongoing risk of exposure to HBV, post-vaccination serologic testing should be considered. Serologic testing should be done within 3 months of the last dose of the 3-dose series if false negative results are to be minimized. Persons who respond inadequately to the three dose series should be offered an additional dose of vaccine and retesting. No more than three additional doses should be given (1).

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INFORMATION

If there are questions about HBV, testing or immunization recommendations, or if educational materials are needed, contact Aaron Roome, PhD, MPH or Monica Rak, RN in the Epidemiology Program (566-5058).

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