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HEPATITIS B FATALITY IN A LABORATORY WORKER

In December 1984, a 37-year-old laboratory technician at a Connecticut hospital and a mother of four children, died of fulminant hepatitis after a five week course of illness. Laboratory testing of acute phase blood was positive for hepatitis B surface and e antigens.

The woman's only identified risk factor for hepatitis B was her occupation. She had been employed as a medical technologist in the hospital chemistry laboratory for 14 years where she handled blood and serum specimens. In the year prior to her death, she had not reported any needlestick incidents or received hepatitis B immune globulin (HBIG). However, she had been diagnosed as having "dermatitis" on the hands that had been severe enough to keep her out of work at times. As a precaution, she had been advised to wear gloves when handling blood specimens, a precaution which she did not always follow.

Although as a laboratory worker handling blood and serum, she was in a group with high priority to receive hepatitis B (HB) vaccine, she had not received it. In 1982, the hospital had offered free vaccine to all high-risk employees including her. However, acceptance was low and less than 20% of employees received an initial dose of vaccine. Low acceptance was felt, in part, to result from concern that the serum-derived HB vaccine might be contaminated with AIDS virus.

Editorial Note

This death was preventable. The victim was in a high occupational priority group to receive HB vaccine (1), but had not received it. HB vaccine has been highly efficacious under clinical trial conditions (2,3) and a full three dose course probably would have prevented initial infection. Furthermore, the efficacy of an initial primary series against clinical illness appears to last at least 4-5 years (4).

Although guidelines exist for HB vaccine use (1,5) and cost-benefit analyses have shown it to be cost effective (6,7), HB vaccine has been underutilized, especially in the occupational setting. Two major reasons for this have been its high cost ($100 for a three-dose series) and fear that the vaccine might contain active AIDS virus. Even when vaccine has been provided free to health care and laboratory employees, it has met with mixed acceptance as it did at the above hospital.

Fear that HB vaccine might contain active AIDS virus appears to be unjustified. Because the initial (and current) vaccine was derived from human serum, elaborate purification, inactivation, and biosafety testing procedures were developed to insure that no recognized and unrecognized viral agents would be transmitted with the vaccine (8). In the wake of fear caused by AIDS, however, further AIDS-specific laboratory and clinical evaluation was performed by the CDC which confirmed a lack of AIDS transmission from HB vaccine and adequacy of the virus inactivation process. (8)

HB vaccine is safe and efficacious. The CDC studies should remove a major impediment to its use. Occupational or other vaccination programs which had previously failed should be re-evaluated in light of this, and a second effort should be made at attaining the fullest possible compliance. Where programs did not exist because of vaccine safety issues, consideration should be given to developing them.

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REFUGEES, HEPATITIS B IMMUNIZATION, AND REIMBURSEMENT

It is estimated that more than 7,000 refugees from Southeast Asia have resettled in Connecticut since 1975. All refugees are screened overseas for four major health problems--tuberculosis, leprosy, venereal disease, and mental defects and disorders. Once a refugee arrives in the state, the sponsor, the local health agency, and the State of Connecticut Department of Health Services (CSDHS) work together to assure that the refugee enters the health/medical care system and receives a comprehensive health assessment and any necessary follow-up care.

In Connecticut, more than 2,800 refugees have received health assessments since August 1980. Because refugees from Southeast Asia have a higher chronic carrier rate of hepatitis B virus (HBV) than the general U.S. population (10-20% versus 0.1-0.5%)(1), testing for hepatitis B surface antigen (HBsAg) is part of each refugee's health assessment after arrival in the United States (2). Of 1,000 refugees tested in Connecticut for HBsAg, 138 (13.8%) were positive. An examination of the three major ethnic groups tested showed the highest prevalence to be in the Vietnamese (17.7%), followed by the Laotians (16.3%) and Cambodians (11.6%). Refugee men were significantly more likely to be HBsAg-positive than women (16.8% vs. 10.7%) (OR = 1.7, $p < 0.01$).

HBV can be transmitted from an infected mother to her infant during childbirth or early childhood. This is the major mode of HBV transmission in sub-saharan Africa and east Asia where HBV infection is hyperendemic in the population (3). Begining in 1983, two subgroups of refugees, pregnant women and unaccompanied minors, have been tested for HBsAg as part of the overseas screening program. When possible, positive test results are noted on forms which accompany the refugee to the U.S. For those who depart before the tests are complete, results are sent directly to the appropriate state health department.

The Immunization Practices Advisory Committee (ACIP) recommends that newborn children of mothers who are HBsAg carriers be given hepatitis B immune globulin (HBIG) and hepatitis B (HB) vaccine (4). In accordance with ACIP recommendations, HBIG should be administered in a 0.5 ml IM dose within 12 hours after birth, and at three and six months of age. HB vaccine should be administered IM in three doses of 0.5 ml of vaccine (10 ug) each. The first dose should be given within 7 days of birth and may be given concurrently with HBIG but at a separate site. The second and third doses should be given one month and six months, respectively, after the first. Providing HBIG and HB vaccine to infants born to refugee mothers who are HBV carriers is a reimbursable expenditure if they are eligible a) under

the program of Refugee Medical Assistance during the first 18 months in the U.S. or b) for the Medicaid program during the first 36 months in the U.S. (5).

The ACIP also recommends that close household contacts of unaccompanied minors who are HBsAg carriers, such as foster family members, receive HB vaccine. The schedule for individuals over 10 years of age is three 1 ml. (20 ug) IM doses of vaccine given at 0, 1, and 6 months (6). Screening of sponsoring family members for HBV susceptibility is probably not cost effective unless some members have previously been at high-risk for HBV infection. The cost of HB vaccine given to appropriate foster family members is a reimburseable expense if the unaccompanied minor was identified as a carrier of HBsAg through overseas screening.

Questions regarding overseas screening or results of screening in Connecticut should be addressed to the CSDHS Refugee Program at (203) 566-3099.

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DIPHTHERIA-TETANUS-PERTUSSIS VACCINE SHORTAGE

The following article from Morbidity and Mortality Weekly Report (1984; 33: 695-696) presents the most current information regarding the Diphtheria-Tetanus-Pertussis (DTP) shortage and provides interim recommendations for DTP administration. The State of Connecticut Department of Health Services (CSDHS) requests that these interim recommendations be implemented immediately and that they be considered policy until larger quantities of DTP vaccine are again available. CSDHS normally distributes DTP vaccine to all public health clinics. It also distributes vaccine to individual health care providers on request. Current stock piles are adequate to ensure that all children in the state get at least a primary series through June, 1985, if the interim recommendations are followed. We will keep you informed of any new developments that may affect the following recommendations, including availability of vaccine after June, 1985. Hopefully, the shortage will be somewhat relieved by the beginning of the summer.

"In the past six months, major changes have occurred in the pattern of manufacture and distribution of diphtheria-tetanus-pertussis (DTP) vaccine in the United States. Now, two of the three U.S. commercial manufacturers (Wyeth and Connaught, Inc.) have stopped distribution of their products. Thus, only one manufacturer (Lederle) now markets DTP vaccine in the United States. Lederle has been increasing its production and expanding its facilities to meet current needs. Careful monitoring of supplies and production schedules previously indicated that national supplies would be adequate. However, some recent lots of Lederle DTP vaccine have failed to meet the manufacturer's requirements for release. Production and testing of this three-component vaccine is complex and requires several months. No new vaccine lots may be available until sometime in February 1985. Comparison of available stocks and the quantity of DTP vaccine now being distributed with the usual national utilization of DTP vaccine indicates that, if current use patterns continue, beginning in January 1985, supplies of DTP vaccine will be very limited, and some areas may be without DTP vaccine.

To minimize the health impact of this shortage, two major options exist--to reduce the amount of vaccine given in a particular dose and to postpone one or more doses. Because it is impossible to predict the degree of protection conferred by partial doses, this option is not recommended. Consequently, considera-

tion has been given to the possibility of postponing one or more doses of the current immunization schedule, which calls for the administration of DTP vaccine at 2, 4, 6, and 18 months of age, with a fifth dose at 4-6 years of age.

With pertussis, there is a significant risk of infection in infancy and early childhood, with 2,463 cases reported in 1983 (51% of them among infants under 1 year old). Additionally, infants are more likely to suffer complications or death from pertussis than are older children. Consequently, it is critical to continue providing protection against pertussis to infants. The first three doses of DTP vaccine provide protection against pertussis in 70%-90% of recipients and immunity to diphtheria and tetanus in over 90% of recipients. The doses given at 18 months and at 4-6 years of age enhance protection through the preschool and early school years, respectively.

Taking all these factors into account, interim postponement of the doses of DTP vaccine given at 18 months and at 4-6 years of age could achieve substantial savings in the rate of DTP vaccine use, while still protecting those at greatest risk of these diseases. To have enough vaccine to provide initial protection to all young infants until larger quantities of DTP vaccine are again available, it will be necessary to begin this approach immediately.

After consultation with members of the Immunization Practices Advisory Committee and the Committee on Infectious Diseases of the American Academy of Pediatrics, the following interim recommendations are made:

1. Effective immediately, all health-care providers should postpone administration of the DTP vaccine doses usually given at 18 months and 4-6 years of age (fourth and fifth doses) until greater supplies are available.

2. When adequate DTP vaccine becomes available, steps should be taken to recall all children under 7 years of age who miss these doses for remedial immunization.

If these recommendations are followed by all providers of DTP vaccine throughout this temporary vaccine shortage, immunity in infants will be maintained at the best possible levels. Public health-care providers and professional organizations throughout the United States have been notified and are being urged to follow these recommendations."

If there are any questions regarding the shortage or the recommendations, please contact the Immunization Program at 566-4141 or 566-5657.

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