Persons using assistive technology might not be able to fully access information in this file. For assistance, please send e-mail to: mmwrq@cdc.gov. Type 508 Accommodation and the title of the report in the subject line of e-mail. The following statement supplements and updates certain

sections of two

previous statements on hepatitis B virus prophylaxis (MMWR

1981;30:423-35 and

MMWR 1982;31:317-28 {1,2}). Those statements should be consulted

regarding

preexposure use of hepatitis B vaccine and prophylaxis of hepatitis

A. INTRODUCTION Prophylactic treatment to prevent hepatitis B (HB) infection

after

exposure to hepatitis B virus (HBV) should be considered in several

situations: perinatal exposure of an infant born to a hepatitis B

surface

antigen (HBsAg)-positive mother, accidental percutaneous or

permucosal

exposure to HBsAg-positive blood, or sexual exposure to an

HBsAg-positive

person. In each of these settings, the risk of HB infection is

known to be

high and justifies preventive measures. Previous recommendations

for

postexposure prophylaxis have relied on passive immunization with

specific

hepatitis B immune globulin (HBIG) (1). However, the recent

demonstration of high efficacy of HB vaccine combined with HBIG in preventing chronic HB infection in infants of HBsAg-positive mothers requires the revision of recommendations for postexposure prophylaxis (3) (Table 1). Passive immunization with HBIG alone has been partially effective in preventing clinical HB in studies of medical personnel after needlestick accidents (4) and sexual exposure to partners with acute HB (5). In addition, HBIG prophylaxis has been shown to significantly reduce the percentage of infants who become chronic HBV carriers after perinatal exposure to HBsAg-positive mothers (6). For perinatal and needlestick exposures, however, HBIG alone is only about 75% effective even when given very soon after exposure, may provide only temporary protection, and is costly (over $150 per adult dose). With the development of HB vaccine, the possibility arose that HB vaccine, alone or in combination with HBIG, might be useful for postexposure prophylaxis. Studies have shown that response to HB vaccine is not

impaired
by concurrent administration of HBIG and that the combination of HB
vaccine
and one dose of HBIG produces immediate and sustained high levels
of
protective antibody to the hepatitis B surface antigen (anti-HBs)
(7). A
recent study examining the efficacy of HB vaccine combined with a
single dose
of HBIG in preventing perinatal transmission from HBsAg carrier
mothers who
were also positive for hepatitis B "e" antigen (HBeAg) showed this
combination to be highly effective in preventing the HBV carrier
state in
infants and significantly more effective than multiple doses of
HBIG alone
(3). PERINATAL TRANSMISSION Transmission from mother to infant during birth is one
of the
most
efficient modes of HBV transmission. If the mother is positive for
both HBsAg
and HBeAg, about 80%-90% of infants will become infected. Although
infection
is rarely symptomatic in the acute phase, approximately 90% of
these infected
infants will become chronic HBV carriers. It has been estimated
that 25% of

these chronic carriers may die of cirrhosis or primary hepatocellular carcinoma (3). In addition, such persons are infectious, and female carriers may subsequently perpetuate the cycle of perinatal transmission. If the HBsAg-positive carrier mother is HBeAg-negative or if anti-HBe is present, transmission occurs in less than 25% and 12% of cases, respectively. Such transmission rarely leads to chronic HBV carriage; however, severe acute disease, including fatal fulminant hepatitis in the neonate, has been reported (8,9). Even if perinatal infection does not occur, the infant may be at risk of subsequent infection from other family contacts. For these reasons, prophylaxis of infants from all HBsAg-positive mothers is recommended, regardless of the mother's HBeAg or anti-HBe status. The primary goal of postexposure prophylaxis for exposed infants is prevention of HBV carrier state. In addition, there is a need to prevent the rare occurrence of severe clinical hepatitis in some of these infants. Admin-

istration of 0.5 ml HBIG to an infant of an HBsAg, HBeAg-positive mother soon after birth and repeated at 3 months and 6 months reduces the probability of chronic infection from about 90% to about 25% (efficacy about 75%). The concurrent use of HB vaccine and various combinations of HBIG increases the efficacy to close to 90%. Since approximately 5% of perinatal infection may occur in utero, it appears likely that no form of postnatal prophylaxis will be 100% effective in this circumstance. Concurrent HBIG and vaccine administration does not appear to interfere with vaccine efficacy. HB vaccine has been shown to be equally immunogenic in neonates, whether given in 10-ug or 20-ug doses. The use of HB vaccine in combination with HBIG in the perinatal setting has the advantages of increasing efficacy, eliminating the need for the second and third doses of HBIG, and providing long-term immunity to those who are not infected during the perinatal period. Maternal Screening Since efficacy of this regimen depends on administering HBIG on

the day of birth, it is vital that HBsAg-positive mothers be identified before delivery. Mothers belonging to groups known to be at high risk of HB infection (Table 2) should be tested routinely for HBsAg during a prenatal visit. If a mother belonging to a high-risk group has not been screened prenatally, HBsAg screening should be done at the time of delivery or as soon as possible thereafter. Management of HBsAg-Positive Mothers and Their Newborns The appropriate obstetric and pediatric staff should be notified directly of HBsAg-positive mothers, so the staff may take appropriate precautions to protect themselves and other patients from infectious material, blood, and secretions, and so the neonate may receive therapy without delay after birth. Recent studies in Taiwan and the United States have confirmed the efficacy of the following regimen (Table 3). Other schedules have also been effective (3,10,11). The major consideration for all these regimens is the need to give HBIG as soon as possible after the infant has physiologically

stablized after delivery. HBIG (0.5 ml) should be administered intramuscularly (IM) after

physiologic stabilization of the infant and preferably within 12 hours of birth. HBIG efficacy decreases markedly if treatment is delayed beyond 48 hours. 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 1 month and 6 months, respectively, after the first (Table 1). HBsAg testing at 6 months may be done for counseling purposes, since HBsAg-positivity at 6 months indicates a therapeutic failure, and the third vaccine dose need not be given if HBsAg-positivity is found. If a mother's HBsAg-positive status is not discovered until after delivery, prophylaxis should still be administered if a venous (not cord) blood sample from the infant is HBsAg-negative. Testing for HBsAg and anti-HBs is recom-

mended at 12-15 months to monitor the final success or failure of therapy. If HBsAg is found, it is likely the child is a chronic carrier. If HBsAg is not detectible, and anti-HBs is present, the child has been protected. Since maternal antibody to the core antigen (anti-HBc) may persist for more than 1 year, testing for anti-HBc may be difficult to interpret during this period.

HB vaccine is an inactivated product, and it is presumed that it will not interfere with other simultaneously administered childhood vaccines (12).

HBIG administered at birth should not interfere with oral polio and diphtheria-tetanus-pertussis vaccines administered at about 2 months of age (Table 3).

ACUTE EXPOSURE TO BLOOD CONTAINING HBsAg

There are no prospective studies directly testing the efficacy of a combination of HBIG and HB vaccine in preventing clinical HB following percutaneous or mucous-membrane exposure to HBV. However, since health-care workers at risk to such accidents are candidates for HB vaccine and since

combined HBIG plus vaccine is more effective than HBIG alone in perinatal exposures, it is reasonable to recommend both HB vaccine and HBIG after such exposure. This combination will provide prolonged immunity to subsequent exposures and may also increase efficacy in preventing HB in such post-exposure situations. In addition, because the second dose of HBIG is not considered necessary if the vaccine is used, the cost of combination treatment is usually less than that of two HBIG doses alone. If exposure to blood occurs in situations where the HBsAg status of the blood is unknown, refer to "Immune Globulins for Protection against Viral Hepatitis" (1). If HBsAg testing reveals the source of the blood to be positive, the following treatment schedule should be instituted as soon as possible. For percutaneous (needlestick), ocular, or mucous-membrane exposure to blood known to contain HBsAg and for human bites from HBsAg carriers that penetrate the skin, a single dose of HBIG (0.06 ml/kg or 5.0 ml for adults)

should be given as soon as possible after exposure and within 24 hours if possible. HB vaccine 1 ml (20 ug) should be given IM at a separate site as soon as possible, but within 7 days of exposure, with the second and third doses given 1 month and 6 months, respectively, after the first (Table 1). If HBIG is unavailable, immunoglobulin (IG {formerly ISG or "gamma globulin"}) may be given in an equivalent dosage (0.06 ml/kg or 5.0 ml for adults). If an individual has received at least two doses of HB vaccine before an accidental exposure, no treatment is necessary if serologic tests show adequate levels (> 10 S/N by RIA) of anti-HBs. For persons who choose not to receive HB vaccine, the previously recommended two-dose HBIG regimen may be used (1).

HBIG FOR SEXUAL CONTACTS OF PERSONS WITH ACUTE HBV INFECTION

Sexual contacts of persons with acute HB infection are at increased risk of acquiring HB infection. Two published studies have assessed the value of postexposure prophylaxis for regular sexual contacts of persons with acute HB infection. One showed that HBIG was significantly more effective

than IG that
contained no measureable anti-HBs in preventing both HB infection and
clinical illness (5). The second study, however, showed comparable disease
rates in persons receiving HBIG and IG containing the increased levels of
anti-HBs found in currently available lots (13). Because data are limited,
the period after sexual exposure during which HBIG is effective is unknown,
but extrapolation from other settings makes it unlikely that this period
would exceed 14 days. The value of HB vaccine alone in this setting is
unknown. However, since about 90% of persons with acute HB infections become
HBsAg-negative within 15 weeks of diagnosis, the potential for repeated
exposure is usually self-limited. HB vaccine is not routinely recommended for
such exposures. Prescreening sexual partners for susceptibility before HBIG treatment is
recommended if it does not delay HBIG administration beyond 14 days after
last exposure. In one study, 27% of regular sexual partners (heterosexual)

were positive for HBsAg or anti-HBs at the time they presented for evaluation (5). Among homosexually active males, over 50% have markers indicating prior infection, and 5%-6% are HBsAg positive (2). Testing for anti-HBc is the most efficient prescreening test to use in this population group. A single dose of HBIG (0.06 ml/kg or 5 ml for adults) is recommended for susceptible individuals who have had sexual contact with an HBsAg-positive persons if HBIG can be given within 14 days of the last sexual contact, and for persons who will continue to have sexual contact with an individual with acute HB before loss of HBsAg in that individual (Table 1). In exposures between heterosexuals, a second HBIG dose should be given if the index patient remains HBsAg-positive 3 months after detection. If the index patient is a known HBV carrier or remains HBsAg-positive for 6 months, HB vaccine should be offered to regular sexual contacts. For exposures among homosexual men, the HB vaccine series should be initiated at the time HBIG is given

following a sexual exposure, since HB vaccine is recommended for all susceptible homosexual men (2). Additional doses of HBIG are unnecessary if vaccine is given. Because current lots of IG contain anti-HBs, it remains an important alternative to HBIG when HBIG is unavailable.

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