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Focus on Hepatitis B

Hepatitis B virus (HBV) is a double-stranded DNA virus in the *Hepadnaviridae* family. The incubation period from time of exposure to onset of symptoms is 6 weeks to 6 months. HBV is found in highest concentrations in the blood, and lower concentrations in semen, vaginal secretions, and wound exudates. Sexual transmission accounts for most adult HBV infections in the United States [1]. Approximately 25% of the regular sexual contacts of infected individuals will themselves become seropositive. [2] About one half of acute HBV infections are symptomatic in adults with 1% of cases resulting in acute liver failure and death. Acutely infected individuals develop clinically apparent acute hepatitis with loss of appetite, nausea, vomiting, fever, abdominal pain and jaundice [1].

10-20% of women seropositive for HBsAg transmit the virus to their neonates in the absence of immunoprophylaxis. In women who are seropositive for both HBsAg and HBeAg vertical transmission is approximately 90% [2]. In patients with acute hepatitis B vertical transmission occurs in up to 10% of neonates when infection occurs in the first trimester and in 80 -90% of neonates when acute infection occurs in the third trimester [2].

Chronic infection occurs in about 90% of infected infants, 60% of infected children aged <5 years, and 2%--6% of adults. Among persons with chronic HBV infection, the risk of death from cirrhosis or hepatocellular carcinoma is 15%--25%. [1]

HBV infection does not appear to be teratogenic [3]. However, there appears to be a higher incidence of low birth weight among infants born to mothers with acute infection during pregnancy [3].

In one small study acute maternal hepatitis (type B or nontype B) had no effect on the incidence of congenital malformations, stillbirths, abortions, or intrauterine malnutrition. However, acute hepatitis did increase the incidence of prematurity [4].

Who to Test [1]

- Test all pregnant women at the first prenatal visit for hepatitis B surface antigen (HBsAg).
- Women admitted for delivery who have not had prenatal HBsAg testing should have blood drawn for testing [5].
- Test all susceptible contacts (including all family members) with hepatitis B panel (HBsAg, antiHBc, antiHBs).

Screening and vaccination of susceptible contacts should be done by the family's pediatrician, primary health-care provider, or the physician evaluating the clinical status of the HBsAg-positive pregnant women.

Interpretation of the Hepatitis B Panel

Tests	Results	Interpretation
HBsAg anti-HBc anti-HBs	negative negative negative	susceptible
HBsAg anti-HBc anti-HBs	negative positive positive	immune due to natural infection
HBsAg anti-HBc anti-HBs	negative negative positive	immune due to hepatitis B vaccination
HBsAg anti-HBc IgM anti-HBc anti-HBs	positive positive positive negative	acutely infected
HBsAg anti-HBc IgM anti-HBc anti-HBs	positive positive negative negative	chronically infected
HBsAg anti-HBc anti-HBs	negative positive negative	four interpretations possible *

* 1. May be recovering from acute HBV infection.

2. May be distantly immune and test not sensitive enough to detect very low level of anti-HBs in serum.

3. May be susceptible with a false positive anti-HBc.

4. May be undetectable level of HBsAg present in the serum and the person is actually a carrier.

A positive HBsAg in the absence of IgM anti-HBc is indicative of chronic infection.

If positive, this test result should be reported to state perinatal immunization or HBV prevention programs to ensure proper case management of the mother and appropriate postexposure immunization of her at-risk infant [1] In addition the baby's health-care provider should be notified about the mother's HBsAg-positive status, and a copy of the original lab report should be sent to the hospital.

“ More than 90% of women found to be HBsAg-positive on routine screening will be HBV carriers, routine follow-up testing later in pregnancy is not necessary for the purpose of screening. When the mother is thought to have acute hepatitis, when there has been a history of exposure to hepatitis, or when particularly high-risk behavior such as parenteral drug abuse has occurred during the pregnancy, an additional HBsAg test can be ordered during the third trimester” [6]

Treatment

The treatment of acute HBV infection is supportive.

Persons with chronic hepatitis B should be referred to health-care professionals with experience in the treatment of hepatitis B for possible treatment with alpha-interferon or lamivudine [1]. Interferon does not appear to adversely affect the embryo or fetus. However, the data is limited, and the potential benefits of interferon use during pregnancy should clearly outweigh possible hazards [7-9].

Initial data do not suggest that Lamivudine is teratogenic [10]. Lamivudine has been used in the latter half of pregnancy in attempt to prevent perinatal transmission of hepatitis B virus infection with mixed success [11,12]

Postexposure Prophylaxis for Susceptible Pregnant Women [1, 13] Exposure to Persons Who Have Acute Hepatitis B

When exposure has occurred as a result of sexual contact within 14 days after the most recent sexual contact administer :

- A course of HBV vaccine into the deltoid
- A dose of Hepatitis B immune globulin (HBIG) 0.06 mL/kg IM into the contralateral arm.
- For prophylaxis after percutaneous or mucous membrane injury, a second dose of HBIG should be given 1 month later.

The two available monovalent hepatitis B vaccines for preexposure immunization and postexposure prophylaxis are Recombivax HB® (Merck and Co., Inc.) and Engerix-B (SmithKline Beecham Biologicals).

Exposure to Persons Who Have Chronic HBV Infection

Active postexposure prophylaxis with hepatitis B vaccine alone is recommended for sex or needle-sharing partners and non-sexual household contacts of persons with chronic HBV infection

Other Candidates for Vaccination

- Household contacts and sex partners of HBsAg-positive women identified through prenatal screening should be vaccinated [5].
- Persons with history of an STD.
- Persons on hemodialysis, persons receiving clotting factor concentrates, or persons who have occupational exposure to blood.
- All persons who have not been previously vaccinated who receive services in drug treatment programs and long-term correctional facilities
- Pregnant women seeking STI treatment who have not been previously vaccinated and test negative for hepatitis B, should receive the hepatitis B vaccine.

Antepartum

Pregnant Hepatitis B carriers should be advised to:

- Obtain vaccination against hepatitis viruses A as indicated.
- Abstain from alcohol use
- Avoid hepatotoxic drugs such as acetaminophen (Tylenol) that may worsen liver damage.
- Not donate blood, body organs, other tissue, or semen.
- Not share any personal items that may have blood on them (e.g., toothbrushes and razors).
- Inform the infant's pediatrician, OB/GYN, and labor staff that they are a hepatitis B carrier.
- Make sure their baby receives hepatitis B vaccine at birth, one month, and six months of age as well as H-BIG at birth.
- Be seen at least annually by their regular medical doctor.
- Discuss the risk for transmission with their partner and discuss the need for counseling and testing

Liver function testing is recommended for women who test positive for HBsAg [1]

The following recommendations from The Society of Obstetricians and Gynecologists of Canada may be helpful in counseling women considering amniocentesis.

SOGC Recommendations [14]

- "The risk of fetal hepatitis B infection through amniocentesis is low. However, knowledge of the maternal hepatitis B e antigen status is valuable in the counselling of risks associated with amniocentesis.
- For women infected with hepatitis B, hepatitis C, or HIV, the addition of noninvasive methods of prenatal risk screening, such as nuchal translucency, triple screening, and anatomic ultrasound, may help in reducing the age-related risk to a level below the threshold for genetic amniocentesis.
- For those women infected with hepatitis B, hepatitis C, or HIV who insist on amniocentesis, every effort should be made to avoid inserting the needle through the placenta. "

Delivery

Although cesarean delivery has been proposed as a means of reducing mother to child transmission (MCT) of HBV [15] The mode of delivery does not appear to have a significant effect on the interruption of HBV maternal-baby transmission by immunoprophylaxis [16]. Delivery by cesarean section for the purpose of reducing MCT of HBV is not presently recommended by either the CDC [1] or the ACOG [2].

Breast feeding.

With appropriate hepatitis B immunoprophylaxis, breast-feeding poses no additional risk for transmission from infected hepatitis B virus carriers [17,18]

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