

populations such as Australian aborigines and Maoris in New Zealand.^{30, 61-71}

The mechanisms of early childhood transmission in areas of high endemicity are variable. Generally, infections cluster in households of people with chronic infection.⁷² The major determinants of infection include exposure to an HBsAg-positive mother or sibling. The contribution of perinatal transmission to the overall burden of disease is related to the prevalence of HBeAg among pregnant women. If a mother is HBsAg-positive and HBeAg-positive, 70 to 90% of infants become infected if not given immunoprophylaxis.^{73, 74} Among infants born to HBsAg-positive mothers who are HBeAg-negative, approximately 5 to 20% are infected at birth. Infants of HBsAg-positive women who are not infected at birth are at increased risk of HBV infection during early childhood, owing to household contact with infected people.⁷⁵

In east and southeast Asian countries as well as the Pacific, 35 to 50% of HBsAg-positive women are also HBeAg-positive.^{67, 73-79} In these countries, it is estimated that 3 to 5% of all infants may develop chronic HBV infection at birth and that as many as 30 to 50% of all chronic infections among children result from perinatal transmission. In areas of high endemicity where the prevalence of HBeAg among pregnant women is low (i.e., Africa, South America, and the Middle East), perinatal HBV transmission contributes less to the pool of children with chronic infection than does postnatal person-to-person transmission.^{61, 80-84} In general in these areas, 1 to 2% of infants develop chronic infection, and 10 to 20% of all chronic infections among children result from perinatal exposures.

In areas of moderate endemicity, the lifetime risk of HBV infection is 20 to 60%, and infections occur in all age groups. Recognition of acute disease is common because many infections occur in adolescents and young adults. In addition, high rates of HBV-related chronic liver disease also occur, owing to the high prevalence of chronic HBV infection. In general in areas of moderate endemicity, 2 to 7% of pregnant women are HBsAg-positive, and less than 20% of HBsAg-positive women are HBeAg-positive; thus, perinatal transmission accounts for a small proportion (10-20%) of the people with chronic infection. In these areas, early childhood HBV transmission may be quite variable in different regions or among different ethnic groups within a country. Acute disease among adults tends to occur in the same risk groups as in developed countries.

In areas of low endemicity, the lifetime risk of infection is less than 20%, and most infections occur among adults in well-defined risk groups. In the United States, the prevalence of chronic HBV infection is 0.35%, and 5% of the general population has evidence of prior HBV infection.^{85, 86} In the United States, high-risk groups for HBV infection include injection drug users, homosexual men, people who have heterosexual contact with multiple partners, household contacts of people with chronic HBV infection, hemophiliacs, hemodialysis patients and staff, inmates of long-term correctional facilities, people with occupational exposure to blood and infectious body

fluids, and institutionalized people with developmental disabilities.^{87, 88}

Whereas most acute HBV infections in the United States occur among young adults, about one third of the chronic infections are acquired through perinatal and early childhood exposures.⁸⁵ It is estimated that 20,000 HBsAg-positive women give birth each year in the United States and that 9500 infants would become infected if prophylaxis were not provided.^{89, 90} In addition, a number of well-defined populations with high rates of early childhood HBV transmission reside in the United States, including Alaskan Natives, children of Pacific Island communities, and children of first-generation immigrants from countries where HBV is of high or intermediate endemicity. Among U.S.-born children of first-generation immigrants during the first decade of life, infection rates average 1 to 2% per year, and the prevalence of chronic HBV infection ranges from 1 to 7%.⁹¹⁻⁹³ These infections are acquired through exposure to HBsAg-positive household members and exposures within the community.

In the United States, reports of acute hepatitis B increased by 37% from 1979 to 1985 but since 1986 declined to 1979 levels (Fig. 10-9).^{87, 90} It is estimated that 100,000 to 150,000 people are infected each year and that 5000 people die each year owing to HBV-related liver disease. Three hundred of these deaths are due to fulminant hepatitis, 3000 to 4000 to cirrhosis, and 600 to 1000 to primary hepatocellular carcinoma.⁸⁵

Worldwide, the consequences of acute and chronic HBV infection are major public health problems. Studies in Taiwan have demonstrated that people with chronic HBV infection are predisposed to developing chronic liver disease and have a more than 100-fold increased risk of hepatocellular carcinoma when compared with noninfected people.⁹⁴ Approximately 5% of the world's population (300 million people) has chronic HBV infection, which is the leading cause of chronic hepatitis, cirrhosis, and hepatocellular carcinoma worldwide.⁷⁷ Approximately 500,000 to 1 million people die annually owing to HBV-related liver disease.

PASSIVE IMMUNIZATION

The discovery that passively acquired anti-HBs could protect individuals from acute clinical hepatitis B and chronic HBV infection if given soon after exposure led to the development of a specific immune globulin containing high titers of anti-HBs. This HBIG was used before hepatitis B vaccines became available and is recommended, often in combination with hepatitis B vaccine, as postexposure prophylaxis following (1) perinatal exposure for an infant born to an HBsAg-positive mother, (2) percutaneous or mucous membrane exposure to HBsAg-positive blood, or (3) sexual exposure to an HBsAg-positive person (see *Indications for Vaccine, Postexposure Prophylaxis*). HBIG is also used to protect patients from severe recurrent HBV infection after liver transplantation.

HBIG is prepared by the Cohn Oncly fractionation procedure from serum containing high titers of anti-