

Epidemiology Update

Acute Hepatitis B

Acute Hepatitis B Key Points

- ◆ During 2001-2010, 152 acute hepatitis B cases occurred in Hennepin County residents. This represents 43.6% of the cases in Minnesota.

Characteristics of these cases include:

- ◆ The median age was 36 years (range: 13 to 70 years).
- ◆ 104 (68%) were reported in males and 48 (32%) in females.
- ◆ 61(40%) were white, 62 (41%) were black, 6 (4%) were Asian, 6 (4%) were American Indian, 9 (6%) were of Hispanic ethnicity, and 8 (5%) were unknown race.
- ◆ 40 (26%) were in the 20-29 age group, 49 (32%) were in the 30-39 age group, and 40 (26%) were in the 40-49 age group.
- ◆ 90 (59%) reported jaundice.
- ◆ 36 (24%) were hospitalized.
- ◆ Risk behaviors included: 33 (22%) had sexual contact with two or more partners, 9 (6%) used injection drugs; 85 (56%) had no identified or unknown risk behaviors.
- ◆ Using a risk assessment tool is valuable in identifying persons who may be infected.

Introduction

This *Epidemiology Update* on hepatitis B highlights the occurrence of the acute symptomatic hepatitis B disease in Hennepin County residents from 2001-2010. It also stresses the need to assess for risk behaviors and to provide prevention messages.

This issue of *Epidemiology Update* is one in a series of reports from Hennepin County Human Services and Public Health Department – Epidemiology.

Background

Hepatitis B is a viral infection that affects the liver. Clinical manifestations of acute hepatitis B virus (HBV) infection are age dependent. Infants, young children (younger than 10 years of age), and immunosuppressed adults with newly acquired HBV infection are usually asymptomatic. Older children and adults are symptomatic with jaundice in 30%-50% of infections.¹ The onset of acute hepatitis B is usually insidious with anorexia, malaise, nausea, vomiting, right upper quadrant abdominal pain, dark urine, and clay-colored or light stools. Occasionally, extrahepatic manifestations occur and include skin rashes, arthralgias, and arthritis. Fulminant hepatitis occurs with a case-fatality rate of 0.5%-1%.²

Among newly infected, unimmunized persons, chronic HBV infection develops in >90% of infants, 20%-50% of children aged 1-5 years, and 6%-10 % of older children and adults. Of chronically infected persons with HBV, 15%-25% will die from cirrhosis, liver failure, or hepatocellular carcinoma (HCC).¹ In the United States about 800,000 to 1.4 million people live with chronic HBV. Chronic HBV infections account for an estimated 3000 deaths each year in the United States.² However, the risks of those outcomes vary and are higher in men, people who are older, people who ingest large amounts of alcohol, and people who are co-infected with HIV.

The World Health Organization (WHO) estimates that up to 2 billion people have been infected with HBV; about 350 million live with chronic HBV infection, and about 600,000 people die from HBV-related liver disease or HCC each year.²

The prevalence of chronic HBV infection among persons immigrating to the United States from Central and Southeast Asia, the Middle East, and Africa varies (range: 5%-15%) and reflects the patterns of HBV infection in the countries and regions of origin.³

Reservoir

Infected humans are the only known source of this infection.

Transmission

HBV is primarily transmitted through contact with infectious blood, semen, or other body fluids (e.g., perinatally from infected mother to infant, sexual contact with an infected person, and/or sharing of contaminated needles, syringes, or other injecting drugs or injection drug equipment).

Other potential risks of transmission include long-term dialysis, occupational blood exposure, and tattooing or body piercing with non-sterilized equipment.

Transmission can occur by sharing toothbrushes, razors and/or materials used to snort drugs, but these do not appear to be an efficient means of transmitting the virus. Hepatitis B is not transmitted by hugging, kissing, or sharing eating utensils.

Incubation Period

The incubation period ranges from 45 days to 180 days with an average 60-90 days.¹ Chronic infection can persist for up to 20 or more years before the onset of cirrhosis or HCC.

Infectious Period

All persons who are hepatitis B surface antigen (HBsAg) positive are considered potentially infectious. Persons can be infective weeks before the onset of the first symptoms. However, with the majority of HBV-infected persons the virus may persist indefinitely. HBV is 50-100 times more infectious than HIV.²

Risk Assessment

Because most cases are asymptomatic, healthcare providers are strongly encouraged to do a risk assessment on their patients. The Minnesota Department of Health (MDH) has created a [risk assessment tool](#) designed to be filled out by the healthcare provider.

The IOM report² estimates that 65% of those infected with hepatitis B do not know that they are infected because they have never been tested and are asymptomatic. These questions help identify risk behaviors not only for hepatitis B, but also for hepatitis C, and HIV, as well as other sexually transmitted diseases. It offers a starting point for discussion about risk behaviors. Identifying patient's past and current risk behaviors is very important to determine the need for testing, referral to specialists for possible treatment, and providing prevention and control messages to help decrease transmission to others.

Perinatal hepatitis B is a concern for babies born to HBsAg positive women. MDH has [guidelines](#) for testing the mother and treatment for the newborn. Local public health nurses work with families and healthcare providers to ensure infants receive vaccination and post vaccination testing in a timely manner.

Persons for Whom HBV Screening is Recommended³

- Persons who use illicit injection drugs in the present and/or the recent or remote past. Even those who have used only one time and do not consider themselves drug users
- Sex partners of infected persons
- Sexually active persons who are not in long-term, mutually monogamous relationships (e.g., more than one sex partner during the previous 6 months)
- Men who have sex with men
- Household contacts of persons with chronic HBV infections
- Infants born to HBV-infected mothers
- Health care, emergency medical and public safety workers at risk for occupational exposure to blood or blood-contaminated body fluids
- Residents and staff of facilities for developmentally disabled persons
- Persons who have chronic liver disease
- Hemodialysis patients
- Persons born in areas of high or intermediate prevalence rates including refugees, immigrants and adopted children
- Travelers to countries that have intermediate or high prevalence of HBV infection

Diagnosis

If a patient presents with acute hepatitis, it is prudent to perform tests for hepatitis A, B and C to determine which, if any are the cause. Several sources indicate that only about 30%-50% of adult patients with new hepatitis B infections have

symptoms, consequently hepatitis B virus may not be diagnosed in the acute phase.

Of the 152 acute cases in Hennepin County residents diagnosed between 2001 and 2010, 90 (59%) reported jaundice and 36 (24%) were hospitalized.

Recommended Laboratory Tests

[Hepatitis B virus nomenclature and interpretation of laboratory results.](#)

The presence of HBsAg is indicative of ongoing HBV infection and potential infectiousness. In newly infected persons, HBsAg is present in serum 30-60 days after exposure to HBV and persists for variable time periods. Anti-HBc (hepatitis B core antibody) develops in all HBV infections, appearing at onset of symptoms or in liver test abnormalities in acute HBV infection, rising rapidly to high levels. Anti-HBc persists for life in persons who recover from HBV infection and those who become chronically infected. Acute or recently acquired infections can be distinguished by presence of the immunoglobulin M (IgM) class of anti-HBc, which persists for approximately 6 months. However, among infected infants, passively transferred maternal anti-HBc may persist beyond the age of 12 months, and IgM anti-HBc may not be present in newly infected children younger than 2 years of age, especially if they acquired their infection through perinatal transmission.⁴

In persons who recover from HBV infection, HBsAg is eliminated from the blood, usually in 2-3 months, and anti-HBs (hepatitis B surface antibody) develops during convalescence. The presence of anti-HBs indicates immunity from HBV infection. After recovery from natural infection, most persons will be positive for both anti-HBs and anti-HBc, whereas only anti-HBs develops in persons who are successfully vaccinated against hepatitis B. Anti-HBs can also be present in persons who have received HBIG. Persons who do not recover from HBV infection and become chronically infected remain positive for HBsAg (and anti-HBc), although a small proportion (0.3% per year) eventually clear HBsAg and might develop anti-HBs.⁴

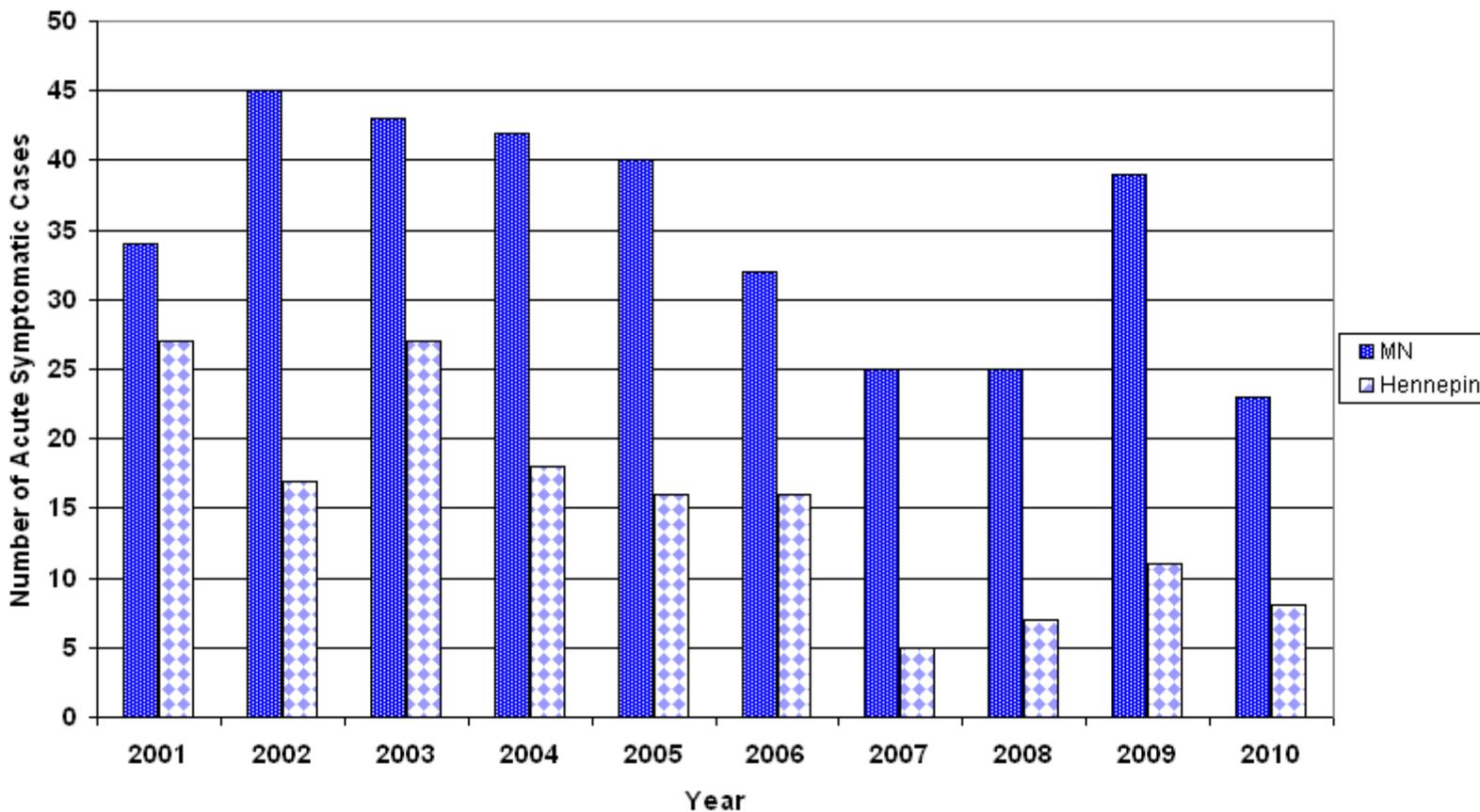
Based on surveillance data and modeling, Centers for Disease and Prevention (CDC) estimates that there has been an 82% decrease in the incidence of acute HBV infection in the United States since 1990 with a total of new infections in 2007 estimated at 43,000.² Of those new infections, about 1,000 infants acquire the infection during birth from their HBV-infected mothers. The majority of new acute HBV cases in the United States are in adults who acquire their infection through sexual contact, sharing drug injection equipment, and needlestick injuries.²

Data

From 2001-2010, 348 cases were identified in Minnesota, of which 152 (43.6%) were from Hennepin County. The majority of cases occurred within the seven-county metropolitan area. Graph 1 shows the number of acute, symptomatic hepatitis B cases identified in Minnesota and Hennepin County from 2001-2010 by year.

Graph 1

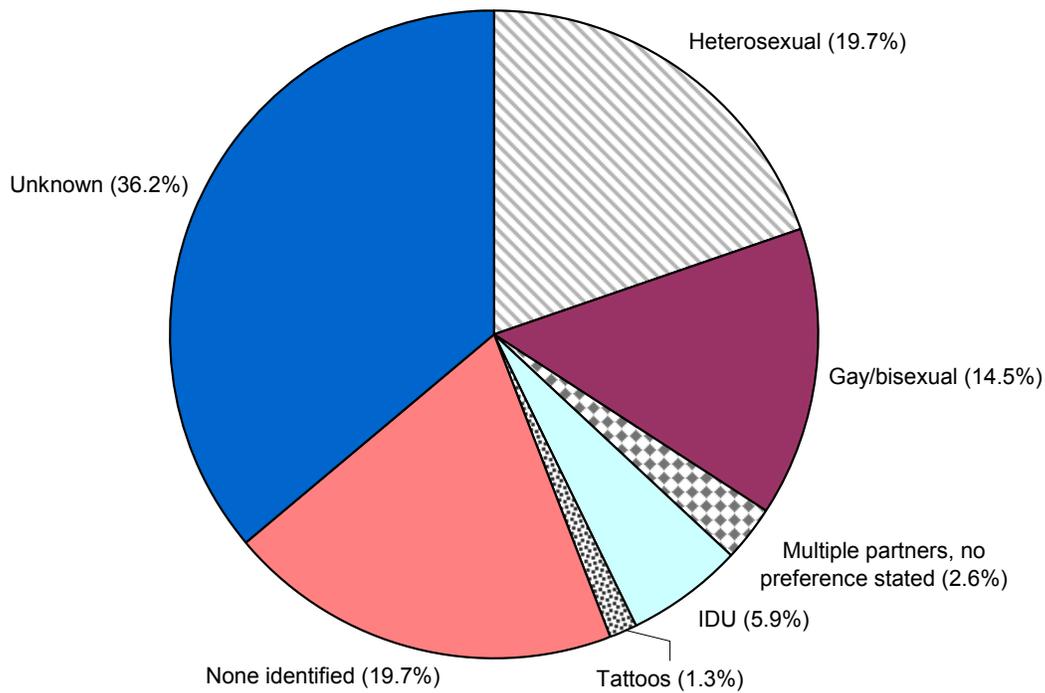
**Acute, Symptomatic Hepatitis B Cases
Minnesota and Hennepin County
2001-2010**



Graph 2 shows the breakdown by risk data for the 152 acute, symptomatic HBV cases in Hennepin County from 2001-2010.

Graph 2

**Acute Hepatitis B Cases by Risk Factors
Hennepin County
2001-2010**



■ Heterosexual (19.7%)	■ Gay/bisexual (14.5%)	■ Multiple partners, no preference stated (2.6%)
■ IDU (5.9%)	■ Tattoos (1.3%)	■ None identified (19.7%)
■ Unknown (36.2%)		

Attempts were made to collect risk behavior information on the case-patient for the six months before the onset of symptoms by talking with the healthcare provider about information gathered at the case-patient's visit and by interviewing the case-patient, if possible. Among the 152 case-patients, 33 (22%) had sexual contact with two or more partners. Of the 33, 11 were gay/bisexual, 18 were heterosexual, and four had no sexual preference stated. Five (3%) had sexual contact with a known HBV positive partner. Eighteen (12%) had sexual contact with one or an unknown number of partners. Nine (6%) used injection drugs; 2 (1%) had tattoos, 30 (19.7%) had no risks identified upon interview; and 55 (36%) had unknown risk behaviors because the healthcare provider was unable to identify any risk behaviors or public health staff were unable to contact the person to ask additional questions.

Postexposure Prophylaxis (PEP)

(See Appendix B)

Hepatitis B immune globulin (HBIG) and hepatitis B vaccine in combination or hepatitis B vaccine alone are highly effective in preventing infection after exposure to HBV.³ HBIG is typically used as an adjunct to vaccination.

The effectiveness of PEP is determined by the early administration of the initial dose of vaccine. The effectiveness of PEP diminishes the longer after exposure it is initiated, but the interval is likely ≤ 7 days for needlestick exposures and ≤ 14 days for sexual exposures.

Treatment

Identifying chronic HBV-infected patients is important with more treatment options now available to delay or prevent progression of fibrosis and to prevent the development of cirrhosis. Refer to a specialist who will make the determination if the patient is a candidate for treatment based on factors predicting sustained virologic response and genotype.

Reporting

Promptly report acute cases (suspect or lab-confirmed) to the [MDH](#) at 651-201-5414 or Hennepin County Human Services and Public Health – Epidemiology at 612-543-5230.

Surveillance

The public health surveillance system relies on healthcare providers and laboratories to report all cases of hepatitis B to state or local public health departments. It requires standardized, systematic, continuing collection and management of data. Accurate and timely reporting of hepatitis B cases is necessary to identify outbreaks in healthcare and community settings.

Investigations

A number of outbreaks associated with healthcare settings have been reported nationally. None have been identified in Hennepin County or Minnesota.

In January 2009, the Annals of Internal Medicine published a review of outbreak information that had been submitted to the CDC from 1998-2008.⁵ Eighteen hepatitis B outbreaks were identified; 3 were in outpatient clinics, 7 were in nursing homes, and 8 were in assisted-living facilities. Lapses in basic infection control techniques lead to transmission of the virus in these settings. These lapses included mishandling of injection equipment, preparing drugs and intravenous infusions in a contaminated environment, shared use of fingerstick devices and/or glucometers without cleaning among diabetic residents; and common storage of used and unused blood glucose monitoring equipment (fingerstick devices, glucometers). Inadequate cleaning and disinfection practices were also documented.⁵

HBV is comparatively stable in the environment and remains viable for ≥ 7 days on environmental surfaces at room temperature.³

Every healthcare setting should have infection control practices in place that are observed and reviewed on a regular basis. The Association for Practitioners in Infection Control (APIC) has produced a manual for infection control in ambulatory care that may be useful.

IOM (Institute of Medicine) Report: Hepatitis and Liver Cancer: A National Strategy for Prevention and Control of Hepatitis B and C²

The report released in January 2010 urges a national strategy to improve prevention, detection, and treatment of hepatitis B and hepatitis C. Early identification of viral hepatitis with referral to prevention and care services can decrease transmission to others. In addition, a [Morbidity and Mortality Weekly Report](#) states that most cases of hepatocellular cancer are preventable.

Prevention and Control

Healthcare providers should provide information to patients infected with HBV regarding how to prevent further harm to the liver and transmitting HBV to others.

- If currently injecting drugs, provide referrals to needle access and disposal programs and drug treatment programs.
 - If currently using alcohol, discuss abstaining or referral to appropriate treatment or support services.
 - Review all the patient's reported medications, dietary supplements, and herbs to see if any may damage the liver.
 - Encourage patients that are not immune to hepatitis A to get this vaccine.
 - Discuss sexual transmission of HBV. If patient is not in a long-term monogamous relationship, emphasize latex barrier precautions as a way to prevent the spread of HBV and other pathogens.
- ** Partners of HBV patients should be screened and offered hepatitis B vaccine if susceptible.

- Patient should NOT:
 - donate blood, body organs, other tissue, or semen
 - share items that may have blood on them
 - share personal care items (e.g., razors, toothbrushes)
 - share home therapy items (e.g., needles)
- Patient should cover cuts and sores on skin.

Points to Remember

- Do a risk assessment on all patients.
- Inform patient of risks for acquiring HBV infection.

- Discuss how to prevent spreading HBV to others.
- Discuss need for hepatitis B vaccine for all susceptible contacts (household and sexual).
- Vaccinate all patients with risk behaviors that are not immune to hepatitis A or do not have a history of having the vaccine.
- Refer patient to a gastroenterologist or hepatologist so they can determine if patient is a candidate for treatment.
- Follow appropriate infection prevention techniques in your clinical setting.
- Report acute cases of hepatitis B to Hennepin County Public Health Epidemiology at 612-543-5230 or the MDH at 651-201-5414.

References:

1. Control of Communicable Diseases Manual. American Public Health Association; 2009.
2. Hepatitis and Liver Cancer: A National Strategy for Prevention and Control of Hepatitis B and C. IOM Report; 2010.
3. A Comprehensive Immunization Strategy to Eliminate Transmission of Hepatitis B Virus Infection in the United States. Part II: Immunization of Adults. MMWR 2006; 55: (RR-16): 1-33.
4. Vaccine Preventable Disease Surveillance Manual, 4th edition; 2008. Hepatitis B. Chapter 4, 1-11.
5. Nonhospital Health Care-Associated Hepatitis B and C Virus Transmission: United States, 1998-2008. Ann Intern Med 2009;150:33-39.

Links to Hepatitis B Information

- [Viral Hepatitis B](#)
- [American Liver Foundation](#)
- [LiverHope](#)
- [The Hepatitis Information Network](#)
- [Hepatitis Foundation International](#)
- [National Digestive Diseases Information Clearinghouse](#)