October 2010

Epidemiology Update

Acute Hepatitis C

Acute Hepatitis C Key Points

- During 2000-2009, 22 acute hepatitis C cases occurred in Hennepin County residents. This represents 13% of the cases in Minnesota.

Characteristics of these cases include:

- The median age was 37 years (range: 20 to 57).
- Twelve (54%) were reported in males and 10 (46%) in females.
- Fourteen (64%) were white, six (27%) were black, two (9%) were unknown race, Hispanic ethnicity.
- Seven (32%) were in the 30-39 age group and six (27%) were in the 40-49 age group.
- Risk behaviors of cases included: seven (32%) used injection drugs; one (4%) used intranasal drugs; three (14%) had multiple sexual partners; two (9%) had sexual contact with a known HCV-infected partner, one (4%) had sexual contact with a partner that was both HCV-infected and an injection drug user; two (9%) had no risks identified upon interview; and six (27%) had unknown risk behaviors.
- Using a risk assessment tool is valuable in identifying persons who may be infected.

Introduction

This *Epidemiology Update* on hepatitis C highlights the occurrence of the acute symptomatic hepatitis C disease in Hennepin County residents from 2000-2009. 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 C virus (HCV) infection is the most common chronic bloodborne infection in the United States, with 2.7-3.9 million persons being chronically infected.

Hepatitis C is a viral infection that affects the liver. About 25-30% of persons newly infected with HCV are symptomatic (considered to be acute cases). The onset of acute hepatitis C is usually insidious with anorexia, vague abdominal discomfort, malaise, and weakness. Less common symptoms include nausea, vomiting, and jaundice.

Chronic HCV infection develops in 75-85% of HCV-infected persons; 60-70% will develop chronic liver disease, 5-20% will develop cirrhosis over a period of 20-30 years, and 1-5% will die from consequences of chronic infection (cirrhosis or hepatocellular carcinoma). Chronic HCV and hepatitis B virus infections that persist for decades are major risk factors for cirrhosis and hepatocellular carcinoma. Chronic HCV infections account for an estimated 8,000-10,000 deaths each year in the United States.

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World Health Organization (WHO) estimates that some 130-170 million people (approximately 2-3% of the world population) are chronically infected with HCV. Most populations in Africa, the Americas, Europe and South East Asia have anti-HCV prevalence rates under 2.5%. Prevalence rates for the Western Pacific regions average 2.5–4.9%. In the Middle East, the prevalence of anti-HCV ranges from 1% to more than 12%.[1]

Reservoir

Infected humans are the only known source of this infection.

Transmission

HCV is primarily transmitted through percutaneous exposure to infected blood or blood products (e.g., injecting drugs or transfusion of blood from unscreened donors). Other potential risks of transmission include long-term dialysis, occupational blood exposure, and tattooing or body piercing with non-sterilized equipment.

Transmission can occur through sexual contact and perinatal exposure and 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. However, persons who have multiple sexual partners or have sex with a partner who is HCV- positive and/or is an injection drug user, or who have a history of sexually transmitted disease are at higher risk of acquiring HCV.

Hepatitis C is not transmitted by hugging, kissing, sharing eating utensils, or breastfeeding.

Incubation Period

The incubation period ranges from 14 days to 180 days with an average 45 days. Chronic infection can persist for up to 20 or more years before the onset of cirrhosis or hepatocellular carcinoma.

Infectious Period

The infectious period can occur from one or more weeks before the onset of the first symptoms. However, with the majority of HCV-infected persons the virus may persist indefinitely. Peaks in virus concentration appear to correlate with peaks in alanine aminotransferase (ALT) activity.[1]

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.

One report estimates that 75% of those infected with hepatitis C 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 C, but also for hepatitis B, 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 determining the need for testing, referral to specialists for possible treatment, and providing prevention and control messages to help decrease transmission to others.

Persons for Whom HCV Screening is Recommended [2]

- 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, as well as intranasal drug users who share paraphernalia.
- Persons with conditions associated with a high prevalence of HCV infection including:
    - Persons with HIV infection.
    - Persons with hemophilia who received clotting factor concentrates prior to 1987.
    - Persons who have ever been on hemodialysis.
    - Persons with unexplained abnormal aminotransferase levels.
- Recipients of transfusions or organ transplant prior to July 1992 including:
    - Persons who were notified that they had received blood from a donor who later tested positive for HCV infection.
    - Persons who received a transfusion of blood or blood products.
    - Persons who received an organ transplant.
- Children born to HCV-infected mothers.
- Health care, emergency medical and public safety workers after a needle stick injury or mucosal exposure to HCV- positive blood.

Diagnosis

It may be difficult to discern whether a patient has an acute or chronic infection. Several sources indicate that only about 25-30% of patients with new hepatitis C infections have symptoms, consequently hepatitis C virus is infrequently diagnosed in the acute phase.

Recommended Laboratory Tests

For screening purposes, use the Antibody to HCV (Anti-HCV) test.

If Anti-HCV is positive by enzyme immunoassay (EIA) or chemiluminescence assay (CIA), then confirm using one of two methods:

1) Use signal to cut-off ratio:

Anti-HCV screening test positive results with a signal to cut-off ratio predictive of a true positive as determined by the Center s for Disease Control and Prevention (CDC) for the particular assay are considered confirmed. No additional confirmatory test is needed.

OR

2) Confirm using a more specific assay

Recombinant immunoblot assay (RIBA)

- If negative: no additional action is necessary at this time.
- If positive, HCV infection is confirmed.
- If indeterminate: perform reverse transcription polymerase chain reaction (RT-PCR) for HCV RNA

RT-PCR for HCV RNA:

- If not detected, perform RIBA for anti-HCV (some patients with HCV infection might be intermittently HCV RNA negative).
- If detected, HCV infection is confirmed (represents viremia and the presence of active infection).

Data

From 2000-2009, 163 cases were identified in Minnesota, of which 22 (13%) were from Hennepin County. The majority of cases occurred outside the seven-county metropolitan area. Graph 1 shows the number of acute, symptomatic hepatitis C cases identified in Minnesota and Hennepin County from 2000-2009 by year.

Graph 1

Acute, Symptomatic Hepatitis C Cases
Minnesota and Hennepin County
2000-2009

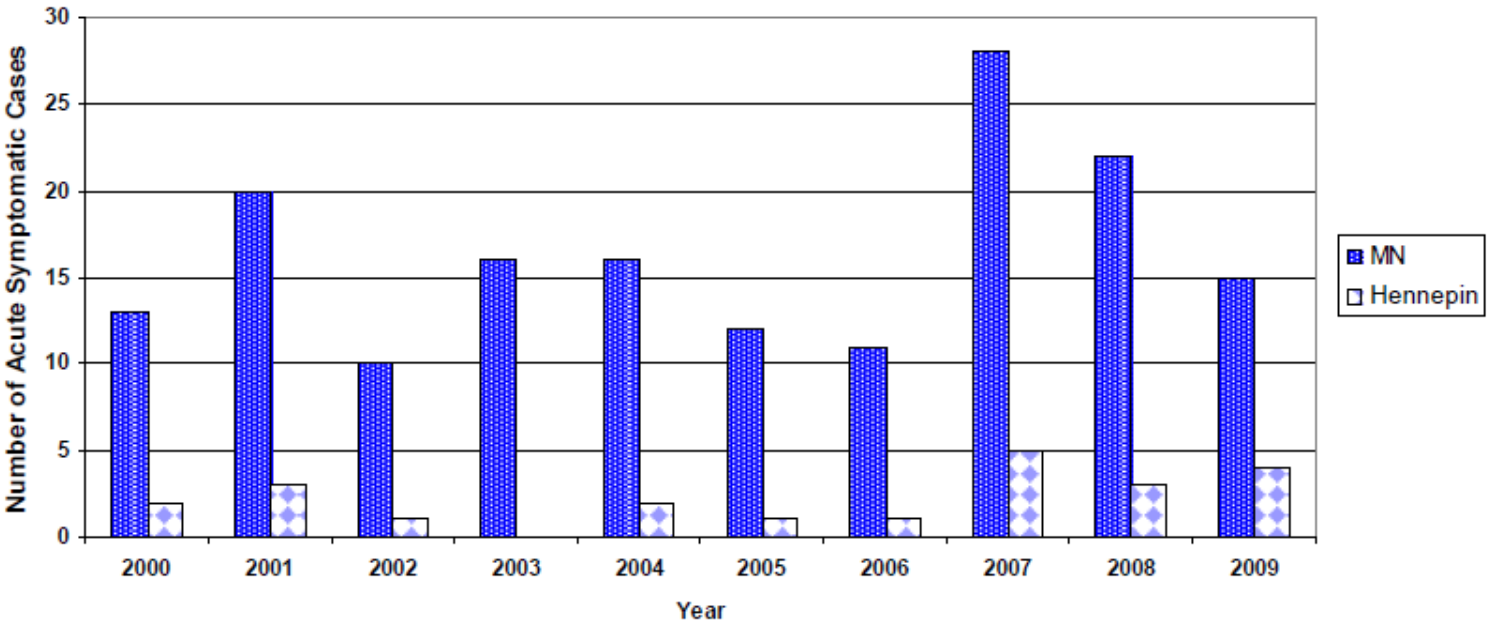

Table 1 shows the breakdown by risk, gender, race, age group and geographic location of the 22 acute, symptomatic HCV cases in Hennepin County from 2000-2009. An additional 12 cases were asymptomatic but were identified when their hepatitis C antibody test seroconverted from negative to positive. (These cases were not included in Table 1.)

Acute, Symptomatic Hepatitis C Cases
By Risk Behavior, Gender, Race, Age Group, City
Hennepin County

Table. 1

Risk Behavior	Number	Gender		Race			Age Group				City	
		Male	Female	White	Black	Unknown Hispanic	20-29	30-39	40-49	50+	Mpls	Suburban
Drug Use	8	4	4	5	2	1	1	5	2		5	3
Sexual activity	6	4	2	4	2			1	2	3	5	1
None identified	2	1	1	1	1		2				1	1
Unknown	6	3	3	4	1	1	1	1	2	2	3	3
Total	22	12	10	14	6	2	4	7	6	5	14	8

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 22 case-patients, seven (32%) used injection drugs; one (4%) used intranasal drugs; three (14%) had multiple sexual partners; two (9%) had sexual contact with a known HCV-infected partner, one (4%) had sexual contact with a partner that was both HCV-infected and an injection drug user; two (9%) had no risks identified upon interview; and six (2%) 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.

Treatment

The goal is to delay or prevent progression of fibrosis and to prevent the development of cirrhosis. With more treatment options now available it is important to identify HCV-infected patients and refer to a specialist who will make the determination if they are 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 C to state or local public health departments. It requires standardized, systematic, continuing collection and management of data. Accurate and timely reporting of hepatitis C cases is necessary to identify outbreaks in healthcare and community settings, such as the outbreak in drug-using young adults that was identified in Dakota County in 2010.

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. Sixteen hepatitis C outbreaks were identified; 10 were in outpatient clinics and six were in hemodialysis centers. Lapses in basic infection control techniques lead to transmission of the virus in these settings. These lapses included syringe reuse and subsequent contamination of anesthesia and other medication vials used between multiple patients, mishandling injection equipment, and preparation of injection materials in a contaminated environment. Inadequate cleaning and disinfection practices were also documented.[3,4]

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 C[5]

The report was released in January 2010 urges a national strategy to improve prevention, detection, and treatment of hepatitis C and hepatitis B. 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

Provide information to the patient regarding how to prevent further harm to the liver and transmitting HCV 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 and B to get these vaccines.
- Discuss sexual transmission of HCV. If patient is not in a long-term monogamous relationship, emphasize latex barrier precautions as a way to prevent the spread of HCV and other pathogens.
- Patient should NOT:
  - donate blood, body organs, other tissue, or semen
  - share items that may have blood on them
  - share personal care items (eg, razors, toothbrushes)
  - share home therapy items (eg, 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 HCV infection.
- Discuss how to prevent spreading HCV to others.
- Vaccinate all patients with risk behaviors that are not immune to hepatitis A and/or hepatitis B or do not have a history of having either 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 C 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. Diagnosis, Management, and Treatment of Hepatitis C: An Update. Hepatology 2009; 49(4):1335-74.
3. SHEA Guidelines for Management of Healthcare Workers Who are Infected with Hepatitis B Virus, Hepatitis C Virus, and/or Human Immunodeficiency Virus. Infect Control Hosp Epidemiol 2010; 31 (3): 203-232.
4. Nonhospital Health Care-Associated Hepatitis B and C Virus Transmission: United States, 1998-2008. Ann Intern Med 2009;150:33-39.
5. Hepatitis and Liver Cancer: A National Strategy for Prevention and Control of Hepatitis B and C. IOM Report; 2010.

Links to Hepatitis C Information

- Viral Hepatitis C CDC's main page
- American Liver Foundation
- VA Hepatitis C Resource Centers
- Hepatitis C Association
- HCSP- HCV Advocate
- LiverHope
- The Hepatitis Information Network
- Hepatitis Foundation International
- National Digestive Diseases Information Clearinghouse

Links to Diagnosis

- Hepatitis C Virus (HCV) Infection Testing for Diagnosis
- Diagnosis, Management, and Treatment of Hepatitis C: An Update from the American Association for Study of Liver Disease

Links to Lab Testing

- Signal to cut-off ratios for particular assays
- Reference for Interpretation of Hepatitis C Virus (HCV) Test Results
- Guidelines for Laboratory Testing and Result Reporting of Antibody to Hepatitis C Virus