

Hepatitis A takes hold in the community

BY ELIZABETH HEAVEY, PhD, RN, CNM

Abstract: In 2016, large outbreaks of hepatitis A virus (HAV) infection began to occur among high-risk individuals, including those with a history of drug use and those experiencing homelessness. This article focusses on HAV infection among high-risk individuals in the community, including those experiencing homelessness.

Keywords: HAV, hepatitis A infection, homelessness, liver disease, vaccination

While working on a mobile health unit that specializes in treating people experiencing homelessness, a nurse saw a familiar client, JC, who lived in an inactive subway tunnel. JC, 55, had a history of alcohol abuse and mental illness and had recently been jailed after stopping his antipsychotic medications. He came to the van mumbling and scratching his skin. His BP was 152/87 mm Hg, heart rate 96, and temperature 99.5°F (37.5°C). Taking his history, the nurse learned that he had started vomiting a few days ago and “didn’t feel good.” He reported very dark urine (bilirubinuria) and the

nurse noted jaundice and scleral icterus. JC seemed most concerned about his pruritus. The nurse had JC transported to a nearby hospital ED, where bloodwork results included: total bilirubin level, 3.2 mg/dL (normal, 0.3–1.0 mg/dL); serum alanine aminotransferase (ALT), 700 U/L (normal in males, 10–40 U/L); positive for anti-hepatitis A virus (HAV) immunoglobulin M (IgM) antibodies and negative for anti-HAV immunoglobulin G (IgG) antibodies. JC was one of the growing number of individuals infected in a community outbreak of HAV among the homeless population.

HISTORICALLY, HAV (once called infectious hepatitis) was common during military campaigns.¹ In the 1970s, when serologic tests were developed that distinguished between hepatitis A and hepatitis B, vaccine development began in earnest. In 1996, the CDC recommended vaccinating high-risk individuals for HAV. Subsequently, national infection rates dropped, but HAV remained the most reported type of hepatitis in this country until 2004, when the incidence of hepatitis B was higher.^{1,2}

In 2006, the number of HAV infections plummeted further as HAV vaccination was added to the universal child vaccination recommendations.¹ This declining trend continued until 2016, when large outbreaks began to occur largely among individuals with a history of drug use, those experiencing homelessness, and men who have sex with men (see *HAV incidence in the US, 2011–2018*).³

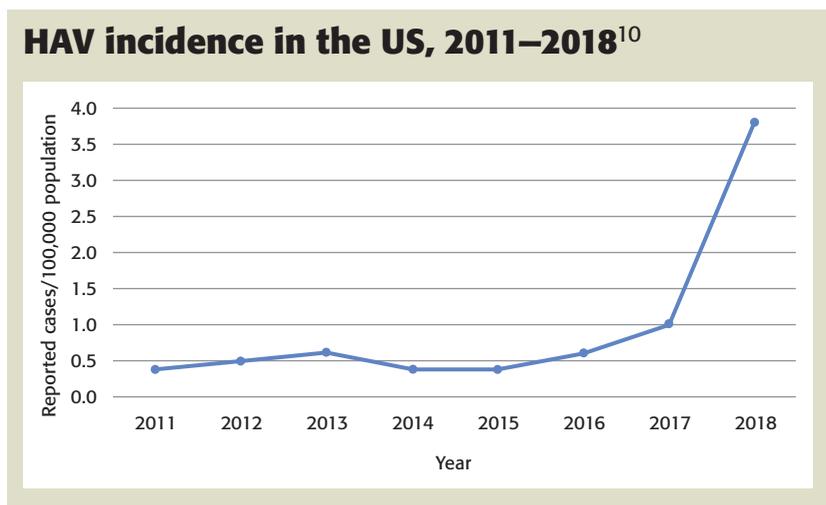
Today, over 68% of HAV infections in the US occur among individuals with a history of drug use or homelessness.³ Globally, HAV remains associated with poor sanitation; in areas with these conditions, close to 90% of children are infected with HAV before age 10.⁴

This article focusses on HAV infection in the US among high-risk individuals, including those experiencing homelessness.

HAV transmission

HAV is a communicable, vaccine-preventable infection of the liver. It is normally self-limiting and does not lead to chronic infection.⁵ However, some individuals experience severe, potentially fatal complications such as fulminant hepatitis. According to the CDC, case-fatality estimates range from 0.3% to 0.6% for all ages and up to 1.8% among adults over age 50.¹

In this country, HAV infection is acquired primarily via the fecal-oral route by either person-to-person contact or ingestion of contaminated



food or water (see *Fecal shedding, viremia, and antibody changes*).^{1,6} However, a shift is currently occurring to person-to-person transmission through contaminated needles or other drug injection supplies, sexual activity (including oral sex), or general unsanitary conditions.⁷ Because HAV is present in blood, it can also be transmitted via blood transfusion, but this is rare.¹

Once a person is infected, viral replication occurs in the liver; the virus then travels into the blood.¹ Hepatocellular damage occurs as the infected patient's immune system attempts to destroy and clear the virus, leading to characteristic signs and symptoms such as fatigue, anorexia, and jaundice.^{5,8}

Individuals infected with HAV will begin to shed the virus via the biliary system into fecal matter 2 weeks before developing signs and symptoms.^{1,3} The viral load in feces is substantially higher than the concentration in blood until clinical signs and symptoms begin to occur.

By the third week after signs and symptoms appear, most adults no longer shed the virus in stool. However, children may shed the virus for a longer period and may be a significant source of exposure for close contacts while having an undiagnosed infection.¹

Who is at risk?

As discussed in more detail below, the CDC recommends HAV vaccination for all at-risk populations. Those at higher risk for HAV infection include:^{3,6,9}

- all children, who should be vaccinated against HAV at ages 12 to 23 months.
- anyone experiencing homelessness or unstable housing.
- travelers visiting areas where HAV is endemic.
- those in close contact with individuals infected with HAV.
- people who use illicit drugs (injectable or noninjectable).
- men who have sex with men.
- those who are or were recently incarcerated.
- those with any type of chronic liver disease, including cirrhosis.

Healthcare workers, including nurses, have not been shown to be at high risk of occupational exposure to HAV.⁶ Nurses caring for patients with HAV who are incontinent or need diapers should follow standard and contact precautions when providing care.¹⁰

Signs and symptoms

More than 70% of adults who are infected with HAV experience symptoms but young children with HAV infection are rarely symptomatic.⁸ In adults, signs and symptoms typically

appear about a month after HAV exposure and include an abrupt onset of nausea, vomiting, anorexia, fever, fatigue, and abdominal pain. Within a few days, patients may develop jaundice, bilirubinuria, and pale, clay-colored (acholic) stool, which may be followed by a rash and pruritus.⁸ More severe infections can lead to pancreatitis, anemia, renal disease, cholestatic hepatitis, relapsing hepatitis, and fulminant hepatitis.³

Most cases of HAV infection are self-limiting and resolve in less than 2 months. However, many high-risk individuals, such as those who use illicit drugs or who are experiencing homelessness, are already in poor health and may have poor outcomes after developing HAV.^{1,3}

An estimated 1% of patients with HAV infection will develop fulminant liver failure.⁸ In addition, 10% to 15% of those infected experience a prolonged period of clinical illness. In these patients, resolution can take up to 6 months and the virus may be excreted periodically as patients experience relapsing signs and symptoms.¹

HAV is not associated with chronic infection and patients who recover from HAV infection have lifelong immunity.¹¹

Diagnosis

The CDC lists these clinical diagnostic criteria for HAV:¹⁰

- An acute illness with discrete onset of any sign or symptom consistent with acute viral hepatitis, such as fever, headache, malaise, anorexia, nausea, vomiting, diarrhea, abdominal pain, or dark urine.
- jaundice or elevated total bilirubin levels (3.0 mg/dL or more), or elevated serum ALT levels (more than 200 IU/L).
- no other likely diagnosis.

Patients with an abrupt onset of HAV signs and symptoms and those who are at risk for HAV infection should be tested for the virus. Serum IgM anti-HAV antibodies are detectable about a week before signs and symptoms appear. These antibodies are present for almost all patients with acute HAV once signs and symptoms appear and remain present through the early convalescent period of infection.

Providers should keep in mind that IgM anti-HAV antibodies can persist for up to 6 months after acute infection, so the presence of IgM anti-HAV may also indicate previous infection with persisting antibodies.⁸

IgG anti-HAV antibodies first appear when the patient is recovering from acute infection or after vaccination. They provide immunity from future infections. The presence of IgG anti-HAV antibodies without IgM anti-HAV antibodies indicates vaccination or a prior HAV infection, not an acute infection.⁸

In addition, during outbreaks polymerase chain reaction (PCR) testing may be helpful to identify infection and monitor the patient's response to treatment.^{1,12} PCR testing directly detects HAV RNA, which is present early in the infection and then diminishes as the infection resolves. Antibodies and antigens are later markers of infection.

Treatment

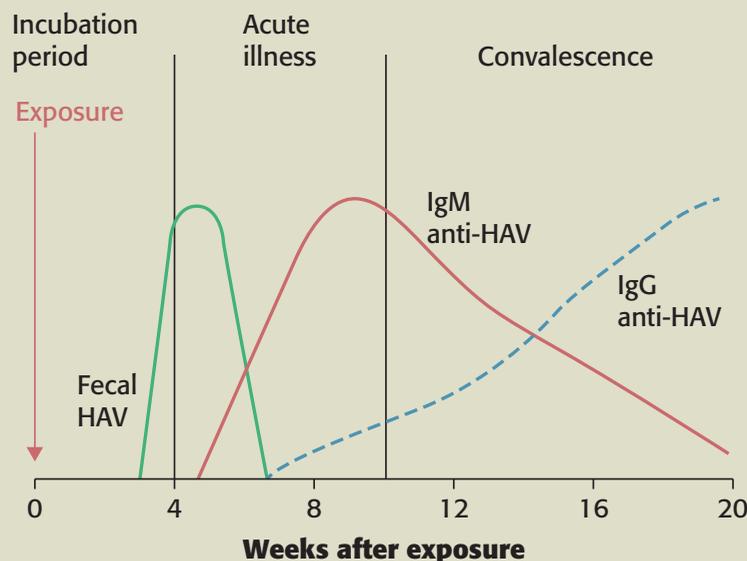
Patients with HAV infection are treated with supportive measures and management of any complications. Patients infected with HAV should stay home from work or school until they are eating and drinking normally and are afebrile, and their jaundice has completely resolved.¹³ Pharmacologic interventions for pain, fever, pruritus, and nausea may be indicated.¹¹ Instruct patients infected with HAV to avoid all alcohol and any medication metabolized in the liver such as acetaminophen.^{8,13}

As always, nurses can help educate patients about the importance of optimal hand hygiene and safe food preparation in the prevention of the spread of infectious diseases. For example:¹³

- Wash hands regularly, and always after eating or preparing food, using the bathroom, or changing a diaper.
- Heat cooked foods thoroughly to eliminate the virus. Heating food to more than 185°F (85°C) for 1 minute inactivates HAV.

Fecal shedding, viremia, and antibody changes¹⁸

The sequence of fecal shedding of HAV, HAV viremia, and HAV antibody (IgM and IgG anti-HAV) changes in hepatitis A.



- Clean environmental surfaces with a disinfectant such as a household bleach solution. Chlorine and iodine also kill HAV.
- Avoid consuming tap water and raw foods when traveling in areas where sanitation is poor.

Prevention

Because HAV is highly transmissible and may be associated with significant morbidity, prevention is a public health priority. Two equivalent options for single inactivated HAV antigen vaccines are currently available in the US, Havrix and Vaqta.³ Twinrix, a combination vaccine that contains both HAV and HBV antigens, is available for patients who also need HBV vaccination. The number and timing of doses depends on the vaccine selected and the patient's age.^{1,3}

If indicated, it is safe to administer the HAV vaccine to pregnant women.¹⁰ Vaccination poses no known risk to the fetus, whereas HAV infection can cause pregnancy complications.¹⁴ Consequently, HAV vaccination is recommended for pregnant women at risk for HAV infection.

In 2019, the Advisory Committee on Immunization Practices (ACIP) recommended HAV vaccination for all high-risk individuals.¹⁵ Although obtaining health and vaccination records to establish immunity status before administering the vaccine is optimal, if records are not available, at-risk individuals should simply be vaccinated. It is not harmful to vaccinate someone who was previously vaccinated or who was already immune due to previous infection with HAV.¹⁶ A single dose of inactivated HAV vaccine is 95% effective at preventing infection, and nearly 100% of patients who receive the recommended two doses of the vaccine will develop protective antibodies.^{1,16} Possible adverse reactions, which are usually transient and mild, include local injection site reactions, fatigue, and headache. Rarely, severe allergic reactions have been reported, so the

vaccine is contraindicated in patients with a history of a severe allergic reaction to the vaccine or vaccine components.^{1,9} Administration guidelines, which vary by patient characteristics, are available at www.cdc.gov/hepatitis/outbreaks/InterimOutbreakGuidance-HAV-VaccineAdmin.htm.

In the event of an outbreak, post-exposure prophylaxis (PEP) is recommended for unvaccinated people who have been exposed to HAV in the previous 2 weeks. These individuals should be given a dose of either single-antigen hepatitis A vaccine or HAV-specific IG as soon as possible within 2 weeks of exposure.⁶ Twinrix is not recommended for PEP.¹⁶ Pre-exposure prophylaxis is also recommended for unvaccinated individuals who are traveling to or working in international locations with significant levels of HAV.¹⁰

Public health implications

Vaccination efforts should focus on those at high risk. Whenever possible, vaccines should be made available at community sites serving individuals at risk, such as jails, needle exchange programs, substance abuse treatment programs, and homeless shelters (see *HAV outbreaks target the homeless population*). Measures to ensure resources are available for the personal hygiene, handwashing, and sanitation needs of those experiencing homelessness will help stop the spread of the disease. In addition, clinicians in EDs and primary care settings should be alert for patients at risk and offer vaccination as indicated.³

Nurses should be aware of the changing transmission patterns associated with current HAV outbreaks and advocate for a comprehensive public health response.⁷ To successfully limit the spread of the virus, nurses and other healthcare professionals must address the specific concerns of many of those infected with HAV, such as assistance in securing income, housing, and healthcare. This also helps

HAV outbreaks target the homeless population^{6,8,11,17}

Between 2016 and 2018, the number of reported HAV infections nearly tripled from what it had been during the previous 3 years. Outbreaks among people experiencing homelessness began in 2016 in Southern California and spread eastward. Between then and November of 2018, more than 28,000 cases of HAV were reported, with 69% of those cases concentrated in six states: Kentucky, Ohio, Tennessee, West Virginia, Indiana, and Florida. Over 280 deaths from HAV were reported, with 62% being concentrated in these six states.

to establish a trusting relationship with individuals who are sometimes reluctant to engage with institutions or governments even when healthcare is available. Effective communication between all members of the healthcare team, including emergency medical service providers, may help identify at-risk patients.⁷

Travelers to countries where HAV is endemic should be cautious about food and water consumption and follow appropriate vaccination guidelines. Because of the risk of exposure associated with international travel, nurses should conduct an appropriate travel screen/history for all patients.¹¹

Encouraging all patients to follow the ACIP-recommended vaccine schedule should be integrated into routine primary care.¹ Nurses should also educate high-risk patients, including those who work with HAV-infected primates or in a lab that handles HAV, about the risk of exposure and the importance of vaccination.

Because HAV is a reportable illness, nurses should promptly alert the health department about any identified cases to ensure timely follow-up and containment before the infection spreads. Vaccinations

should be recorded in the state immunization information system, if available, so the health department can quickly determine if an individual is at risk during an outbreak.⁶

JC's case progression

After JC was diagnosed with HAV, he was admitted to the hospital and remained for several days for treatment. A multidisciplinary team of nurses, healthcare providers, and social workers provided supportive measures that helped relieve his dehydration, vomiting, and pruritus, and the psychiatric service administered and established follow-up care for his psychiatric disorder. The social worker helped place him in supported transitional housing, and regular contact with a case manager from the department of mental health was established.

Nursing care included education and monitoring through follow-up community visits. The county health department responded to the localized outbreak with investigation teams that worked in multiple locations to provide outreach efforts and vaccinations to other homeless individuals living in shelters and encampments. Staff in the mobile health

unit have not seen JC since his release from the hospital but they continue to serve other homeless individuals in the area and hope he is doing well. ■

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The author and planners have disclosed no potential conflicts of interest, financial or otherwise.

DOI-10.1097/01.NURSE.0000668424.98515.8b

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