Hepatitis E

Disease Plan

Quick Links

Last updated: February 26, 2016 by Jeffrey Eason.

Questions about this disease plan?

Contact the Utah Department of Health Bureau of Epidemiology: 801-538-6191.

✓ WHY IS HEPATITIS E IMPORTANT TO PUBLIC HEALTH?

Hepatitis E virus (HEV) is an enterically transmitted viral hepatitis similar to hepatitis A. While rare in the United States, it is a common cause of hepatitis and jaundice in many parts of the world. Infection may result in an acute illness which is more common among adults than children. The disease can be severe in pregnant women, in whom mortality rates can reach 15-25% during the third trimester. Chronic HEV infection is rare and has been reported in recipients of solid organ transplants and people with severe immunodeficiency.

✓ DISEASE AND EPIDEMIOLOGY

Clinical Description

Hepatitis E infection ranges from subclinical infection to acute illness. The clinical presentation is similar to that of Hepatitis A infection (HAV) and may include; jaundice, anorexia, fever, abdominal pain, and arthralgia (joint pain). HEV infection is typically reported among organ transplant recipients of immunosuppressed individuals. Pregnant women in the third trimester are particularly vulnerable to fatal complications of HEV infection; the case-fatality rate in this group can reach 25%.

Causative Agent

Hepatitis E infection is caused by the hepatitis E virus, a non-enveloped, single-stranded positive sense RNA virus approximately 27-34 nm in diameter. HEV is classified in the genus Hepevirus of the family Hepeviridae. There are four HEV genotypes, all of which can cause illness in humans.

Differential Diagnosis

Hepatitis has a variety of causes including, but not limited to: viral hepatitides (A, B, C, D, E), Epstein-Barr virus, yellow fever virus, drug-induced hepatitis, toxin-induced hepatitis, auto-immune hepatitis, alcohol liver disease, herpes simplex virus, and adenovirus.

Laboratory identification

Definitive diagnosis of HEV infection is based upon the detection of the HEV RNA in serum or feces by polymerase chain reaction (PCR), or by the detection of immunoglobulin M (IgM) antibodies. The inability to detect HEV in clinical specimens does not eliminate the possibility of infection due to the short period of time that the virus circulates in the body. Antibody tests have been associated with false positive and false negative results. IgM anti-HEV appears during the early phase of clinical illness along with elevated alanine aminotransferase (ALT) levels, but both decrease rapidly. IgG anti-

HEV response appears after the initial increase of IgM and continues to increase as its titer increases, which can last from 1 to 14 years after onset of illness.

Figure 1. Typical serological course of hepatitis E virus infection in humans

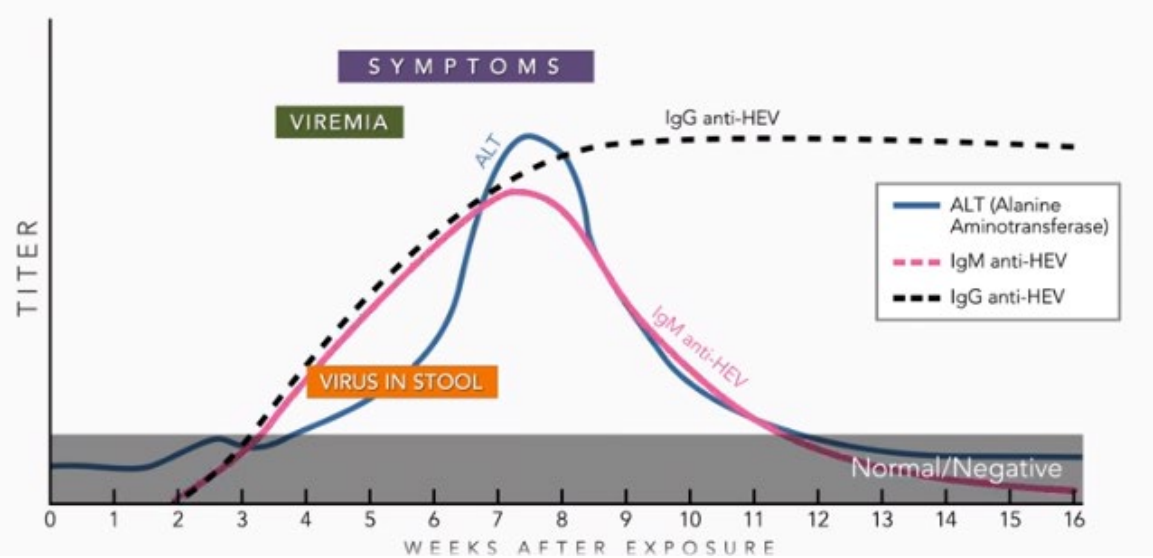

Image courtesy of CDC: http://www.cdc.gov/hepatitis/resources/professionals/training/serology/training.htm

Treatment

Treatment for HEV is supportive, as the disease appears to be self-limiting in non-immunocompromised patients. Preliminary reports suggest that ribavirin may be effective for the treatment of chronic HEV in immunosuppressed patients.

Case Fatality

HEV is more severe among pregnant women, especially those in their third trimester. The case fatality rate for those infected with HEV in this population can reach 25%.

Reservoir

Humans are the natural host for HEV All HEV genotypes can cause illness in humans.

Transmission

HEV is transmitted primarily by the fecal-oral route. The most common vehicle documented during outbreaks is contaminated drinking water. While person-to-person transmission is possible through the fecal-oral route, it is believed to occur less commonly with HEV than with HAV. HEV can be detected in stool one week before onset of illness and up to two weeks after. Patients are infectious during fecal shedding. The potential for HEV transmission from contaminated food is still under investigation, and there is no evidence of transmission by percutaneous or sexual exposure. Evidence suggests that HEV infection may be transmitted from infected animals through fecal contamination.

Susceptibility

Infection is thought to provide lifelong immunity. In the U.S., studies have shown that 20% of the population has immunoglobulin (Ig) G against HEV. Travelers to developing countries, particularly in South Asia and North Africa, are at highest risk of contracting and being diagnosed with symptomatic HEV infection. Rare cases have occurred in the U.S. among persons with no history of travel to endemic countries.

Incubation Period

The average incubation period for HEV is 26-42 days, with a range of 15-64 days.

Period of Communicability

The period of communicability for HEV is unknown. However, HEV has been detected in stool 14 days after the onset of jaundice, and four weeks after the ingestion of contaminated water.

Epidemiology

HEV infection is rare in the U.S. Most reported cases are imported from HEV-endemic countries, where contamination of water is common. Symptomatic HEV infection in the U.S. is uncommon and generally occurs in people who acquire HEV-infection after traveling to countries with endemic HEV.

Figure 2. Geographic distribution of hepatitis E outbreaks in humans

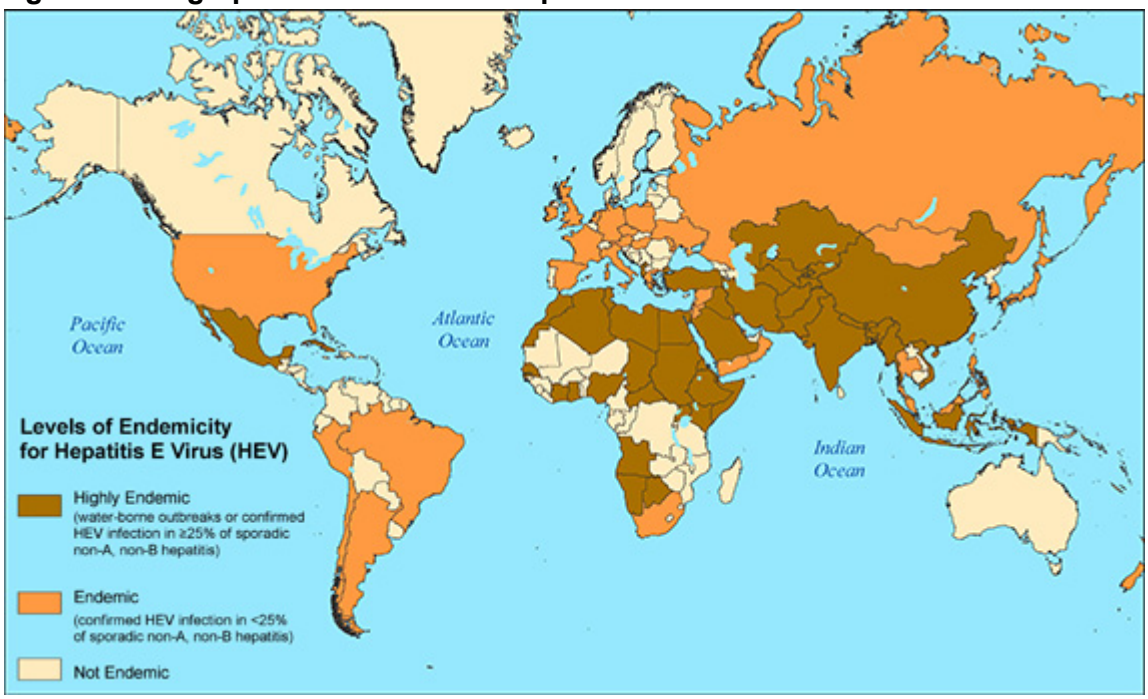

Image courtesy CDC, http://www.cdc.gov/hepatitis/hev/hevfaq.htm

✓ PUBLIC HEALTH CONTROL MEASURES

Public Health Responsibility

- Investigate all confirmed cases of disease and fill out and submit disease investigation forms.
- Identify patient contacts.
- Identify the source of infection for the patient and other possible contacts associated with the infection source.
- Provide education to the general public, clinicians, and first responders regarding disease transmissions and prevention.

Prevention

Persons with HEV infections should prevent fecal-oral transmission of the disease by not cooking or serving food for others until eight days after the onset of jaundice. Infected persons should also abstain from sex until eight days after the onset of jaundice to prevent sexual transmission.

Personal Preventive Measures/Education

Exposure to HEV may be avoided by:

- Always washing hands thoroughly with soap and water before eating or preparing food, after using the toilet, and after changing diapers.
- Washing hands, as well as the child's hands, after changing diapers, and disposing of diapers in a closed-lid garbage can.
- Washing hands thoroughly and frequently when ill with diarrhea, or when caring for someone with diarrhea. Hands should be scrubbed for at least 15-20 seconds after cleaning the bathroom, after using the toilet or helping someone use the toilet, after changing diapers, before handling food, and before eating.

International Travel

Travelers should pay attention to what they eat and drink. Recommendations to travelers include:

- Get all appropriate travel immunizations.
- "Boil it, cook it, peel it, or forget it."
- Drink only bottled or boiled water, keeping in mind that bottled, carbonated beverages are safer than bottled, non-carbonated ones.
- Ask for drinks without ice, unless the ice is made from bottled or boiled water.
- Avoid popsicles and flavored ices that may have been made with contaminated water.
- Eat foods that have been thoroughly cooked and are still hot and steaming.
- Avoid raw vegetables and fruits that cannot be peeled. Vegetables such as lettuce are easily contaminated and are very hard to wash well.
- Peel your own raw fruits or vegetables, and do not eat the peelings.

- Avoid foods and beverages from street vendors.

Vaccines

An effective vaccine against HEV has been developed, but is not commercially available in the U.S.

Case Definition

CSTE does not have a position statement for HEV. HEV is classified based on clinical and laboratory evidence.

Clinical case definition

An acute illness with a discrete onset of any sign or symptom consistent with acute viral hepatitis (e.g. fever, malaise, anorexia, nausea, vomiting, abdominal pain, and hepatomegaly) with jaundice and/or elevated serum aminotransferase (ALT or AST) levels.

Laboratory criteria for diagnosis

Testing for IgM and IgG are available through some commercial laboratories but are not approved by the US Food and Drug Administration meaning that their results should be interpreted with caution. Viral nucleic acid testing (NAT) is the gold standard test approved by the Centers for Disease Control and Prevention (CDC).

HEV testing availability

The CDC's Division of Viral Hepatitis Laboratory (DVHL) can provide diagnostic support for IgM and IgG anti-HEV detection in clinical samples. The DVHL also offers NAT for the detection of HEV RNA in serum and stool samples. There are no fees associated with any of these tests; however, preapproval from the UDOH Bureau of Epidemiology is required prior to specimen submission to the Utah Public Health Laboratory.

Case classification: Suggested case classification

Confirmed: a case that meets the clinical case definition and is laboratory confirmed and is known to be negative for serologic markers of hepatitis A, B, C, and other hepatotropic viruses.

Clinically compatible cases may be confirmed when epidemiologically linked to a confirmed case and are known to be negative for serologic markers of hepatitis A, B, C, and other hepatotropic viruses.

Table 1: Case classification table: suggested case classification

	Case Definition			
Criterion	**Confirmed**			
Clinical Evidence				
Acute onset	N	N	N	N
Jaundice	N		N	
Fever	O	O	O	O
Headache	O	O	O	O
Malaise	O	O	O	O
Anorexia	O	O	O	O
Nausea	O	O	O	O
Vomiting	O	O	O	O
Diarrhea	O	O	O	O
Abdominal Pain	O	O	O	O
Laboratory Evidence				
Elevated serum aminotransferase levels (ALT or AST)		N		N
Hepatitis E IgM positive	O	O		
HEV viral testing (PCR)	O	O		
Serologic markers of hepatitis A, B, C	A	A	A	A
Epidemiological Evidence				
Contact with a confirmed case of HEV			N	N

Notes:
N = This criterion in conjunction with all other “N” and any “O” criteria in the same column is required to classify a case.
O = At least one of these “O” criteria in each category in the same column (e.g., clinical presentation and laboratory findings)—in conjunction with all other “N” criteria in the same column—is required to classify a case.
A = test performed and negative

✓ REFERENCES

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✓ VERSION CONTROL

Updated Dec 2014 – CSTE reporting criteria, case definition, and case classification swim lanes included.
Updated Jul 2015 – Formatting and design edits. Quick links added. Addition of “Why is Hepatitis A and Hepatitis E important to Public Health?” section. Edits to “Causative Agent” and “Public Health Responsibility” sections. Updates to the list of references used. Addition of “UT-NEDSS Minimum/Required Fields by Tab” section.
Updated December 2015 – Separated hepatitis A and hepatitis E into individual plans
Updated February 2016- Created case definition and classification table.

✓ UT-NEDSS Minimum/Required Fields by Tab

Demographic

- ☑ First Name
- ☑ Last Name
- ☑ Birth Gender
- ☑ Race
- ☑ Ethnicity
- ☑ State
- ☑ County
- ☑ Date of Birth
- ☑ Occupation
- ☑ Area Code
- ☑ Phone number

Clinical

- ☑ Date Diagnosed
- ☑ Imported From
- ☑ Onset Date
- ☑ Syndrome:
  - ☑ Please specify:
- ☑ Syndrome
- ☑ Died
- ☑ Date of Death
- ☑ List dose number, date, manufacturer and lot number of all doses given:
- ☑ Has the patient received immune globulin (IG) in the last 6 months?
- ☑ Does the patient also have hepatitis B?
- ☑ Does the patient also have hepatitis C?
- ☑ Does the patient also have hepatitis D?
- ☑ Does the patient also have hepatitis E?
- ☑ Diagnostic Facility (DF)
- ☑ Did the patient have jaundice?
- ☑ Was the patient vaccinated for hepatitis A?

Laboratory

- ☑ Was ALT (SGPT) done?
- ☑ Does the patient have an elevated ALT level?
- ☑ Test Result
- ☑ Test Type
- ☑ Does the patient have an elevated AST level?

Epidemiological

- ☑ Risk Factor
- ☑ Attends school
- ☑ Did the patient attend while ill?
- ☑ What is the name of the facility where the patient handled food?
- ☑ Did the patient work while ill?
- ☑ What is the name of the daycare?
- ☑ Did the patient attend while ill?
- ☑ What is the name of the healthcare facility?
- ☑ Did the patient work while ill?
- ☑ If case works at the facility, did he/she work while ill?

Contacts

- ☑ Childcare Association
- ☑ Was the patient a contact of a person with confirmed or suspected hepatitis A infection?
- ☑ Any contacts ill with similar symptoms?
- ☑ List all contacts in the listed time period below (the communicable period) in the contacts table.
- ☑ Did the patient attend a group event during the exposure period?
- ☑ Does the case live or work in a long-term care facility, assisted living center, or other type of group home setting?
  - Name of facility:

Reporting

- ☑ Date first reported to public health

Administrative

- ☑ Outbreak name
- ☑ State case Status
- ☑ Outbreak Associated