Outbreak 101: Hepatitis A

Megan Hofmeister, MD, MS, MPH
Martha Montgomery, MD, MHS, CTropMed

NASTAD’s Viral Hepatitis Prevention and Surveillance Virtual Learning Collaborative

November 10, 2021

Clinical Features
Hepatitis A Virus (HAV)

- Replicates in the liver, excreted in bile
- Acute illness
- Average incubation period: 28 days
  - Peak infectious period: 2 weeks prior to symptom onset until 1 week after jaundice onset
- Clinical manifestations: fever, headache, malaise, anorexia, nausea, vomiting, diarrhea, abdominal pain, dark urine, jaundice
- Transmission: fecal-oral

Clinical Features and Natural History

- The likelihood of symptomatic HAV infection is related to age
  - Children <6 years old
    - 70% of infections are asymptomatic
    - Jaundice is rare
  - Older children and adults
    - Infection is typically symptomatic
    - Jaundice occurs in >70%

- Prolonged or relapsing hepatitis A in 10-15% of symptomatic patients
- No chronic form
Epidemiology

Hepatitis A Virus Endemicity in the United States

- The United States is considered to have very low HAV endemicity levels
- Cyclic increases occurred every 10–15 years
- The number of reported cases in the pre-vaccine era was ≥21,000 annually

Hepatitis A Cases — United States, 1966–2015

Outbreaks of Hepatitis A – United States, 2016–2021

- CDC has assisted in multiple outbreaks of hepatitis A since July 1, 2016
  - Foodborne Transmission
    - Hawaii – Frozen Scallops
    - Multistate – Frozen Strawberries
  - Person-to-Person Transmission
    - People who use drugs (injection/non-injection) and people experiencing homelessness
    - Men who have sex with men (MSM)
Person-to-Person Hepatitis A Outbreaks: Summary Statistics

- As of November 5th, 2021:
  - >42,850 cases
  - >26,050 (61%) hospitalizations
  - >400 deaths

[Graph showing Hepatitis A Cases — United States, 1966–2019]

Data Source: National Notifiable Diseases Surveillance System
Shifting Hepatitis A Virus Epidemiology

- Past outbreaks were driven by asymptomatic children
- A large proportion of adults are not immune to hepatitis A virus
  - During 2015-2016, 72.8% of US adults ≥20 years old were susceptible to HAV infection
  - In 2018, reported hepatitis A vaccination coverage (≥2 doses) was 11.9% for adults ≥19 years
- Older individuals are more likely to experience severe disease and adverse outcomes
- Vaccination uptake among at-risk adults is low

Increased Morbidity and Mortality during 2016–2021

- Hepatitis A-related hospitalizations were increasing prior to 2016
- Hospitalizations for cases during 2016-2021 outbreaks range from 46% - 88%
- Case mortality in California and Michigan outbreaks approximately 3%
- Coinfections with hepatitis B and hepatitis C

References:


Hepatitis A Vaccination for Outbreak Control

- Vaccination is the cornerstone of controlling community outbreaks
- Post-exposure prophylaxis alone may not effectively control outbreaks
- Targeted vaccination to the groups at highest risk is the best way to control disease spread
- Primary prevention with adequate vaccination of at-risk groups is needed


Outbreak-specific Vaccination Recommendations

- Offer Vaccination to the Following Groups to Prevent or Control an Outbreak
  - People who use drugs (injection or non-injection)
  - People experiencing homelessness
  - Men who have sex with men (MSM)
  - People who are, or were recently, incarcerated
  - People with chronic liver disease, including cirrhosis, hepatitis B, or hepatitis C

Update: Widespread Outbreaks of Hepatitis A among People Who Use Drugs and People Experiencing Homelessness across the United States

https://emergency.cdc.gov/han/han00418.asp
Conducting a Hepatitis A Outbreak Investigation

Hepatitis A Outbreak Investigation

- No systematic, national, molecular surveillance system
- **Typical methods of detection**
  - Routine case surveillance
  - Observations from astute health department staff or healthcare providers
  - During case interviews or contact tracing investigations
- **Confirmation process can be prolonged**
When to Suspect an Outbreak: Hepatitis A Community/Person-to-Person

- Anytime there is an increase in reported hepatitis A cases within a jurisdiction above baseline over a 4-week period.
- Anytime two or more hepatitis A cases are reported during a 50-day time period among people from similar geographic regions with common epidemiological exposures (e.g., drug use, homelessness, men who have sex with men, time spent in the same facility [jail, substance abuse treatment, group home, etc.]).

Defining an Outbreak: Hepatitis A Community/Person-to-Person

Appendix A. Total number of hepatitis A cases reported to CDC through NNDSS by state per year for 2011–2015 and threshold for considering a person-to-person outbreak

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Georgia</td>
<td>27</td>
<td>46</td>
<td>36</td>
<td>24</td>
<td>30</td>
<td>2.72</td>
<td>0.73</td>
<td>5</td>
</tr>
</tbody>
</table>

NNDSS, National Notifiable Diseases Surveillance System
Defining the End of an Outbreak: Hepatitis A Community/Person-to-Person

Appendix A. Total number of hepatitis A cases reported to CDC through NNDSS by state per year for 2011–2015 and threshold for considering a person-to-person outbreak

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Georgia</td>
<td>27</td>
<td>46</td>
<td>36</td>
<td>24</td>
<td>30</td>
<td>2.72</td>
<td>0.73</td>
<td>5</td>
</tr>
</tbody>
</table>

Return to baseline lasting for ≥3 consecutive four-week periods

NNDSS, National Notifiable Diseases Surveillance System

When to Suspect an Outbreak: Hepatitis A Community/Person-to-Person

- **Exclusions**
  - In the absence of known risk factors, any case that occurs in a patient who reports travel to a country or US territory with endemic hepatitis A during their exposure period
  - Any case that is linked to a hepatitis A foodborne outbreak by related sequencing
  - In the absence of known risk factors, any case that is epi-linked to a hepatitis A foodborne outbreak
  - Any case with a specimen collected within 4 weeks of symptom onset that is negative for HAV RNA
Case Investigation

- **Clinical Data**
  - Signs and symptoms, including jaundice
  - Date of earliest symptom onset

- **Diagnostic Tests**
  - IgM anti-HAV
  - ALT, total bilirubin
  - HAV nucleic acid amplification test (NAAT)

- **Risk Factors for Transmission**
  - Drug use, homelessness, international travel, incarceration, contact with a hepatitis A case, MSM

- **Occupation**
  - Food handler

- **Vaccine History**

Acknowledgments

- **Division of Viral Hepatitis, CDC**
  - Laura Cooley
  - Monique Foster
  - Neil Gupta
  - Martha Montgomery
  - Noke Nelson
  - Philip Spradling
  - Eyasu Teshale
  - Mark Weng
  - Shaoman Yin

- **Immunization Services Division, CDC**

- **State and Local Health Jurisdictions**
  - Alabama Department of Public Health
  - Arizona Department of Health Services
  - Arkansas Department of Health
  - California Department of Public Health
  - Colorado Department of Public Health & Environment
  - County of San Diego Health and Human Services Agency
  - Delaware Department of Health and Social Services
  - Florida Department of Health
  - Georgia Department of Public Health
  - Idaho Department of Health & Welfare
  - Illinois Department of Public Health
  - Indiana State Department of Health

- **State and Local Health Jurisdictions (cont.)**
  - Kansas Department of Health & Environment
  - Kentucky Department for Public Health
  - Louisiana Department of Health
  - Maryland Department of Health
  - Massachusetts Department of Public Health
  - Michigan Department of Health & Human Services
  - Minnesota Department of Health
  - Mississippi Department of Health
  - Missouri Department of Health & Senior Services
  - Nevada Department of Health and Human Services
  - New Hampshire Department of Health and Human Services
  - New Jersey Department of Health
  - New Mexico Department of Health
  - New York Department of Health
  - North Carolina Department of Health and Human Services
  - Ohio Department of Health
  - Pennsylvania Department of Health
  - South Carolina Department of Health and Environmental Control
  - Tennessee Department of Health
  - Texas Department of State Health Services
  - Utah Department of Health
  - Vermont Department of Health
  - Virginia Department of Health
  - Washington Department of Health
  - West Virginia Department of Health & Human Resources
Thank you.

lxn7@cdc.gov

For more information, contact CDC
1-800-CDC-INFO (232-4636)

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.