Introduction to Hepatitis A Case Investigations

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Learning Objectives

• How to conduct hepatitis A virus (HAV) case investigations and best practices for interviewing the case, identifying close contacts, and gathering time-sensitive information

• How to assess HAV false positives and how to speak with providers to determine the likelihood of a false positive result

• Importance of data collection completeness to inform statewide preventative measures

• Basic awareness of current outbreaks
Hepatitis A Basics

- **Transmission route**: fecal-oral (person-to-person or contaminated food)
- **Incubation period**: 2-6 weeks
- **Infectious period**: 3 weeks
  - (2 weeks *before* symptom onset through 1 week *after* symptom onset – use jaundice onset date, if present, otherwise earliest related symptom)
- **Symptoms**: jaundice, dark urine, pale/clay colored stool, fever, abdominal pain, nausea, vomiting, diarrhea, fatigue
- **Close contacts**: anyone who would come in close contact with the infected person’s hands or feces
  - Household members (sharing and preparing food for one another, shared bathrooms, hand-to-mouth contact)
  - Sexual contacts
- **Acute illness only** (no chronic infection), rarely fatal, no cure (just palliative care), once you recover you have lifelong immunity
Hepatitis A Case Classification

- Discrete symptom onset with a symptom compatible with HAV \textbf{AND} either jaundice or total bilirubin $\geq 3.0$ \textbf{or} ALT $> 200$ \textbf{AND} absence of more likely diagnosis
  - Example: IgM+ with dark urine and ALT of 250 = confirmed
  - Example: IgM+ with jaundice and diarrhea but no LFTs available = confirmed
  - Example: IgM+ with diarrhea, vomiting and ALT of 33, no bilirubin = suspect

<table>
<thead>
<tr>
<th>Event Name:</th>
<th>HEPA</th>
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<tbody>
<tr>
<td>Event Time Period:</td>
<td>Lifelong</td>
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<tr>
<td>Clinical Criteria (CSTE 2019):</td>
<td>An acute illness with a discrete onset of any sign or symptom consistent with acute viral hepatitis (e.g., fever, headache, malaise, anorexia, nausea, vomiting, diarrhea, abdominal pain, or dark urine) \textbf{AND} a) jaundice or elevated total bilirubin levels $&gt; 3.0 \text{mg/dL}$, \textbf{OR} b) elevated serum alanine aminotransferase (ALT) levels $&gt; 200 \text{IU/L}$, \textbf{AND} c) the absence of a more likely diagnosis.</td>
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<tr>
<td>CSTE Event Classification (2019):</td>
<td>\textbf{Confirmed}</td>
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| | \begin{itemize} 
| | - A case that meets the clinical criteria and is IgM anti-HAV positive \textbf{5, OR} 
| | - A case that has hepatitis A virus RNA detected by NAAT (such as PCR or genotyping), \textbf{OR} 
| | - A case that meets the clinical criteria and occurs in a person who had contact (e.g., household or sexual) with a laboratory-confirmed hepatitis A case 15-50 days prior to onset of symptoms. \textbf{§} 
| | - Not otherwise ruled out by IgM anti-HAV or NAAT for hepatitis A virus testing performed in a public health laboratory. 
| |
| Massachusetts Event Classification (2021): | \textbf{Suspect} |
| | A case that is IgM anti-HAV positive in the absence of information on clinical criteria (symptoms and/or elevated serum amino transferase levels) or when these criteria are not compatible with HAV infection |
Key Lab Tests for HAV Investigations

- Serology – IgM (cannot use total antibody)
- PCR – very rarely will see an RNA, but if we do, this is a confirmed case
- If it’s not a PCR lab, we also need liver function tests (LFTs) to help in case determination:
  - Bilirubin
  - ALTs and ASTs – these can sometimes be recorded under the clinical question package
Goals of Follow-Up

• Determine if it’s a true case
  • Call Infection Preventionist or Provider
    • Do not call the case first – they may not be aware of diagnosis or this may not be a true case of HAV

• Collect clinical information
  • Symptoms and liver function tests: looking for ALT >200 or Bilirubin >3.0
  • If clinical picture isn’t what you expect to see in an acute infection, then ask:
    • What was the reason for testing?
      • Red flag would be them saying “we were just running a routine blood panel” or “it’s a new patient so we ran routine blood work”
    • Vaccination status/recently vaccinated?
    • Previous infection with HAV/recently recovered?
    • Look for Epi link: recently identified as a close contact, or other relevant risk history (e.g. international travel)?
      • Diagnosed with any other hepatitis infection? (could be causing cross-reactivity on tests)

• Identify close contacts to recommend PEP, and identify any foodhandlers with HAV to restrict them from work
False Positives

- They have a positive IgM, but…
- Asymptomatic
  - An asymptomatic adult is very uncommon
    - 90% of older children and adults experience symptoms
    - BUT only 30% of children under 6 years old are symptomatic
- Symptoms are not specific to hepatitis infection:
  - Just reporting abdominal cramps or diarrhea, but no jaundice, or unusually dark urine, or pale stool
  - Could symptoms be due to another cause? Could jaundice be due to substance use or taking a medication?
- Their LFTs are not elevated or are only slightly out of the normal range.
  - With a true acute infection, we would expect to see ALTs >200 (we’ve seen them as high as 7,000!)
- No clear epi-link or known exposure to a confirmed case
- Recent HAV vaccination: IgM is detectable in up to 20% of people who received HAV vaccine when measured 2 weeks post-immunization and could be cause of a false positive
False Positives

- In a non-outbreak time period, most IgM+ results are false positive.
- From January 1, 2021-June 30, 2022, 66% of cases reported were considered false positive (left as suspect).
  - Revoked classification is reserved for those with evidence of previous infection (can only have HAV infection once) or if a case is total anti-HAV positive and IgM anti-HAV negative, (and of course any out of state resident gets reported out and revoked).

### HEPATITIS A CASE CLASSIFICATION IN MASSACHUSETTS FROM JANUARY 1, 2021-JUNE 30, 2022

- **Confirmed**: 16% of cases
- **Revoked**: 18% of cases
- **Suspect**: 66% of cases

*Note:* The chart illustrates the distribution of disease classification cases with the specified percentages.
False Positives cont.

- If the criteria on the previous slide are met, then the provider should be queried as to the reason the individual was tested
  - If testing was for a reason other than acute symptom onset or recent exposure to HAV, it is likely a false positive result
  - Again, a red flag would be them saying “we were just running a routine blood panel” or “it’s a new patient so we ran routine blood work”
    - *Remember: children are often asymptomatic, so in those cases the reason for testing is especially important*
- Ordering providers don’t always fully understand how to interpret these lab results, so sometimes it requires some educating (*see example script on following slide*)
Example Script for False Positives

• “Since this case does not have any symptoms and was tested as a routine blood panel, this is likely a false positive. Let me explain why. Diagnostic tests for hepatitis A are highly sensitive and specific when used on persons with acute hepatitis, but are not specific enough to give accurate results when used as screening tests on persons without appropriate symptoms. I’m happy to provide you with a memo explaining the details of this. If you agree with us calling this a false positive, then we will not pursue any active contact tracing or further follow up with the case unless you decided to diagnose the case as a true Hep A.”

• The provider makes the final call and we do need this decision promptly because if they diagnose it as a true case, we must begin recommending post-exposure prophylaxis (PEP) as soon as possible. Be aware that sometimes a provider will just call it a true case “out of abundance of caution” from a public health standpoint, but we can and should help guide them to the appropriate decision.

• An example template memo to give to providers to explain false positives can be found in MAVEN Help:

[Frequently Asked Questions(FAQs) - TEMPLATE – Educational letter for providers about appropriate use of hepatitis A IgM test (false positives), July 2022]
True Cases

• If it is determined to be a true case:
  • Collect time-sensitive variables
    • Symptom onset to determine infectious period
    • Occupation: is the case a foodhandler? If so, collect where, and dates of work while infectious
      • If case is unemployed, confirmed that was the case during their entire infectious period
      • Also important to identify potential volunteer work that involves foodhandling
    • Identify close contacts within infectious period to recommend PEP
      • HAV vaccine should be administered to all unvaccinated persons ≥12 y.o. (Immunoglobulin (IG) may also be recommended.)
      • PEP for HAV is 1 dose of vaccine. The second dose 6 months later is best for optimal protection, but not required for post-exposure protection purposes
      • **WARNING**: PEP is not known to be effective more than 2 weeks from date of exposure, so timing is of the essence for prevention!
Close Contacts

- Close contacts are those who had contact with the case during the infectious period:
  - All household members
  - Any sexual contacts
  - Anyone sharing food, beverages, eating utensils, or cigarettes with the case (think hand-to-mouth contact)
  - If the case is a resident of a long-term care facility or any other rehab or extended care facility, roommates should be treated as household contacts. Other potential contacts within the facility should be determined on a case-by-case basis taking into consideration such things as how many people share a bathroom, whether or not the case had diarrhea, visitors, nurses, if the case is incontinent, etc.
A Reminder: Foodhandler Definition

• **A foodhandler is any person directly preparing or handling food:**
  • Any person working in a food handling facility.
  • Any person handling clean dishes or utensils.
  • Any person who dispenses medications by hand, assists in feeding, or provides mouth care.
  • Any person who set up trays for patients to eat, feed or assist patients in eating, give oral medications or give mouth/denture care.
  • In daycares, schools, and community residential programs, this includes those who prepare food for clients to eat, feed or assist clients in eating, or give oral medications.
Case Investigation

• **Step 1**: after speaking with the provider and collecting clinical information (symptoms and LFTs) and making sure the case knows of their diagnosis (you should not be the first to tell them), then…

• **Step 2**: call the case:
  - During case interview, discuss who you are and why you know about their diagnosis:
    - “I am the Public Health Nurse for the town of X, and whenever a resident of my town is diagnosed with an infectious disease, it is required by law to be reported to me so that I can reach out to make sure you have the resources you need, understand your risk and so that I can prevent the infection from spreading further. Are you willing to help us by answering a few questions?”
  - Proceed to ask about close contacts and complete the MAVEN risk questions
  - Ask questions in a neutral, non-judgmental tone
  - Be aware of your biases!
    - What assumptions are you making about someone who is elderly? That they don’t have sex or do drugs?
    - What assumptions are you making based on the way they speak? That they are straight/gay?
    - What assumptions are you making when someone tells you they’re married? That they don’t have multiple sex partners?
Case Interview

- Follow the MAVEN question packages to collect information
- If the case did not travel internationally during the incubation period and does not have a known contact with HAV, or any other typical risk, then proceed to complete the “HAV Supplemental Questionnaire” to assess food exposures (an Epidemiologist should have already linked this case to the supplemental questionnaire – 102970544- to populate this question package)
If Case is a Foodhandler

- A DPH Epidemiologist will provide LOTS of support in these instances
- Case must be excluded for one week past symptom onset or resolution of fever, whichever comes last
- Collect the following:
  - Where case worked during infectious period
  - Dates worked during infectious period
  - Specific job duties (what food did case have contact with, how was food handled)
  - Whether case experienced diarrhea and/or vomiting while working and on what dates
  - Whether the case handled ready-to-eat foods without gloves
  - Whether the case performed foodhandling duties at other facilities
  - Number of foodhandlers in the facility
  - Number of patrons on a daily basis for the facility (or number of children/clients if in a daycare or other LTCF)
  - Past record of inspections for facility (if available)
Foodhandler Follow-Up

- If foodhandler’s place of work is in a different city/town from where they reside, notify the local health department for that jurisdiction.

- Create a foodborne illness complaint (and link it to the case) to track follow-up.

- If it is a food establishment, notify the DPH Food Protection Program (FPP) as soon as possible (617-983-6712).

- If a health care agency is the implicated facility, remind the infection control contact at the agency that they also need to contact the DPH Bureau of Health Care Safety and Quality to report the situation (617-753-8000).
Restaurant Investigations

- Contact FPP **before** an inspection or any onsite investigation is conducted
- Key inspection resources can be found within Chapter 8 of Foodborne Illness Reference and Control Manual [https://www.mass.gov/lists/foodborne-illness-investigation-and-control-manual](https://www.mass.gov/lists/foodborne-illness-investigation-and-control-manual):
  - Focus on handwashing practices and restroom facilities, the types of foods and beverages that are served, and how these foods and beverages are handled
  - Obtain a very careful history of which days and shifts the infected person worked, exact duties, types of food handled, any use of disposable gloves, as well as an assessment of the employee's hygiene. Inquire about tasks performed by the infected employee during his/her infectious period which may have differed from normal job duties. Ascertain if food prepared on shift is carried over to the next shift or to the next day. Determine if other employees eat food prepared by the index case. Ask the case whether they worked while symptomatic with diarrhea or vomiting; if so, note the dates on which this occurred. Ask the case if they are a food employee at any other establishments
  - Institute rigorous handwashing and ensure that there is no bare-hand contact with ready-to-eat foods, including foods served raw or handled after the cooking process. High risk foods include, but are not limited to: lettuce, tomatoes and other vegetables put on sandwiches; ingredients of all salads, including fruits and vegetables on salad bars; sliced cooked foods which may become contaminated during deboning or slicing procedures; handling of cold cuts; cake icing or decorations; ice that is scooped by hand or with a possibly contaminated scoop; and condiments for drinks such as olives, lime or lemon wedges
  - Ensure that the ill food employee is excluded according to 105 CMR 300.000 Isolation and Quarantine Requirements
  - Obtain a complete list of all employees, survey other employees for symptoms consistent with hepatitis A, if other employees are symptomatic, they should also be excluded from work and tested for hepatitis A
- FPP might request additional documentation such as an employee illness policy, menu(s), etc. depending on the situation
Foodhandler Follow-Up cont.

- **The following guidelines are applied to other foodhandling employees at the same facility and close contacts of the case who are foodhandlers:**
  - All foodhandlers **with HAV-consistent symptoms** must be excluded and tested for HAV unless they can provide documented proof of immunity (prior HAV infection or HAV vaccination)
    - Those with a negative test result must receive PEP prior to return
    - Those with a positive test result must remain excluded during their infectious period
    - If an employee refuses testing, they must be excluded for 28 days (one average incubation period) from their last exposure to the case while the case was infectious
  - All **asymptomatic** foodhandlers in the facility must receive PEP within 14 days of exposure to the case during their infectious period, unless they provide proof of immunity
    - In most situations foodhandlers receiving PEP within 14 days of their last exposure is permitted (*The Isolation and Quarantine Regulations do not stipulate whether the 14 days are from the first or last exposure*)
    - Employee refuses to receive PEP and no proof of immunity? Must be excluded from foodhandling activities for 28 days
  - As LBOH, you could consider facilitating PEP through a clinic or the employer
  - Facility should continue surveillance for additional cases for **six weeks** from the last day that the case worked during their infectious period
    - Any symptoms should be reported immediately and managed as a symptomatic contact
    - During this six-week period special attention should be paid to appropriate foodhandling practices and heightened awareness of good hygiene on the part of the foodhandlers
Foodhandler Follow-Up cont.

- Once a case has been identified as a foodhandler, the LBOH should...
- **Conduct an inspection of the establishment**
- **Considerations for patron notification:**
  - The decision to identify potentially exposed patrons is made on a case-by-case basis, using information obtained on the case and the establishment, with special regard to hygienic practices and the decision should be made with your assigned Epidemiologist
  - Since common-source transmission to patrons is unlikely, PEP administration to patrons typically is not indicated, but may be considered if:
    - the foodhandler worked during infectious period and both directly handled uncooked or cooked foods and had diarrhea or poor hygienic practices, and
    - patrons can be identified to receive PEP within the 2-week period after exposure
      - In settings in which repeated exposures to HAV might have occurred (e.g., LTCF cafeterias), stronger consideration of HAV vaccine or IG use could be warranted
  - If both of the above criteria are met, the DPH Bureau of Infectious Disease Medical Director may recommend patron notification and would be coordinated jointly by DPH, the LBOH, and facility manager
Summary

- Call provider/IP to collect clinical information to determine if it’s a true case or false positive
  - If false positive, then no further follow up required
- If true case, collect the time sensitive variables (symptom onset and occupation), conduct case interview, identify close contacts, recommend PEP to eligible contacts, and hope that the case or their close contacts aren’t foodhandlers!
- If case is a foodhandler, then
  - Exclude foodhandler from work
  - LBOH conducts inspection of the facility, involve relevant parties (FPP)
  - Symptomatic employees – exclude, test, provide proof of immunity
  - Asymptomatic employees – receive PEP, proof of immunity, or exclude for 28 days
  - Consider if patron notification is necessary – if so, work with DPH to mobilize staff and other resources
EDUCATION & PREVENTION
Current/recent Outbreaks

- Florida outbreak primarily among MSM
- Foodborne outbreak associated with fresh strawberries identified by California
  - Identify any hepatitis A cases with onset on or after 4/1/22 among persons without known risk factors for infection (e.g., international travel, injection/non-injection drug use, persons experiencing homelessness, men who have sex with men, or have an epidemiologic link to these risk groups) who report consumption of strawberries
- As of May 2020, Massachusetts is no longer experiencing the 2-year outbreak occurring among people experiencing homelessness or reporting injection drug use
Education & Prevention

• Educate people on how HAV spreads (fecal-oral)
• So, to prevent spread:
  • Get vaccinated!
  • Wash hands with soap & water
  • Don’t share food, drink, utensils, drug injection equipment etc.
  • If sharing bathroom with a confirmed case, wipe down in between use
  • If foodhandler, stay out of work until infectious period has passed and diarrhea has resolved
  • Be mindful of your risk when consuming raw seafood
  • Be mindful of any food recalls, wash fruits and vegetables
Resources

• Main page for hepatitis A information
  • https://www.mass.gov/hepatitis-a

• Link to resources for holding a vaccination clinic, and educational materials in multiple languages

• HAV vaccination information
  • https://www.mass.gov/service-details/vaccine-administration-and-clinical-guidance

• False Positive Memo for Providers

• MDPH 24/7 line to reach an Epidemiologist: 617-983-6800
QUESTIONS?
Questions

1. Can you address data resources/how up to date Hep A data is? Is MAVEN the best source (doing an extract) or is there dashboard data or public reports available on mass.gov? Any tips/tricks to when data becomes official/published?

2. Who is most at risk for Hep A? Are daycare workers required to be vaccinated against Hep A?

3. What steps need to be taken to exclude a foodhandler from work and how is this enforced? How do they obtain follow up testing?

4. How do you use case occupation data in either your investigations or your prevention strategies?

5. What are the vital answers to questions we need to get immediately. If someone who lives with case & does not get vaxed?

6. Is a patient immune to Hep A once they get it once? If you have had Hep A, should you still get Hep A vaccine if you are high risk?

7. How many cases of Hep A in MA were or are related to an outbreak among IV drug users?

8. IgM and IgG Lab explanations