48 year-old with jaundice

- 48 year old found minimally responsive and brought by friends to ED
- 1 week malaise, chills, headaches, leg pain and weakness
- PMH – ETOH, IDU
- SH – homeless
- Baltimore for 20 years, previously Missouri

48 year-old with jaundice, con’t

- T 39.1; BP 80/50; P 110; 95% 4L; sleepy
- Icteric, non-injected, no murmurs or lymphadenopathy
- Diffuse red maculopapular rash
- WBC 98,000 (79 P, 4 B, 5 My/Meta); Hb 7.7; Plt 31,000
- Creatinine 3.9; UA 1+pro; Bicarb 8; INR 2.5; Tbili 41 (direct 31); ALT/AST 146/213
- HCV Ab pos, HIV Ab neg

48 year old with jaundice

The cause of his illness is:

A. Acute hepatitis A
B. Babesia microti
C. Ehrlichia chaffeensis
D. Leptospira icterohaemorrhagiae
E. SARS-CoV-2
Leptospirosis

1. Exposure to fresh water (eg rafting in Hawaii or Costa Rico) OR rats (Baltimore)

2. Systemic findings (conjunctival suffusion, kidney, skin, muscle, lungs, liver)
   ddx: liver and muscle: flu, adenovirus, EBV, HIV, malaria, Rickettsia/Ehrlichiosis, tularemia, TSS, coxsackie

3. Bilirubin fold change > ALT

Acute Hepatitis in Uganda

• 42 year old female has malaise and RUQ pain; she just returned from 2 months working at an IDP camp in north Uganda. She endorses tick and other 'bug' bites and swam in the Nile. 1st HAV vaccine 2 days before departure. Prior HBV vaccine series.
• Exam shows no fever, vitals are normal. RUQ tender. Mild icteric. ALT 1245 IU/ml; Hb 13.4 g/dl; TB 3.2 mg/dl; WBC 3.2k nl differential.

Which test result is most likely positive?

A. Ebola PCR  
B. IgM anti-HEV  
C. IgM anti-HAV  
D. Schistosomiasis “liver” antigen  
E. 16S RNA for Rickettsial organism

1. Vaccination works vs immune globulin to prevent hepatitis A up to 14d after exposure
2. There are HEV outbreaks, eg. North-Ugandan IDP Camp

3. Hepatitis E: Epidemiologic Clues
   - Outbreaks – contaminated water in Asia/Africa
   - Sporadic - undercooked meat (BOAR, deer, etc)
   - Overseas travel typical
   - USA: endemic rare, genotype 3, IgG serology positive far more than can be explained by cases - can be hard to interpret

4. Hepatitis E: Clinical Clues
   - Fatalities in pregnant women
   - Can be chronic in transplant (rarely in HIV)
   - GBS and neurologic manifestations (vs other hep viruses); pancreatitis
   - Diagnosis: RNA PCR; IgM anti-HEV
   - Treatment: ribavirin for chronic

Acute Hepatitis at ID Week
   - 42 year old homeless male approaches a group of ID fellows while attending ID Week in San Diego.
   - One fellow noticed jaundice and suggested he seek medical testing. With what diagnosis was the fellow most concerned?

Fellow worried about?
A. HAV
B. HBV
C. Delta
D. HCV
E. HEV

1. Hepatitis A: Key Epidemiologic Clues
   People, Places and Things (Foods)

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1. Hepatitis A: Key Epidemiologic Clues – People, Places and Foods

- People: Through contaminated food, water, or person-to-person contact
- Places: Restaurants, schools, hospitals, and work settings
- Foods: Unpasteurized shellfish, undercooked or raw meat

2. Hepatitis A: Key Clinical Clues

- There are outbreaks all over the world now
- The most common cause of acute hepatitis in USA
- Clinical syndrome:
  - fulminant on HCV
  - relapsing: symptoms/jaundice recur <12 mo

3. Vaccination to Prevent Hepatitis A

- Pre-exposure: vaccinate
  - HOW: Inactivated vaccines USA (HAVRIX, VAQTA)(TWINRIX)
  - WHOM: HCV or HBV positive persons/chronic liver disease/homeless/MSM/PWID/Travelers/HIV pos/adoptive exposure
  - All children receive hepatitis A vaccine at age 1 since 2006
- Post-exposure: vaccinate (and possibly IG)
  - Unless > 40 years or immunosuppressed then IG is “preferred”
  - Close exposure (sex or IDU partner) not casual (eg office worker)

Vaccination works vs immune globulin to prevent hepatitis A up to 14d after exposure

Acute Viral Hepatitis B Clues

- Most linked to sex, drugs, nosocomial
- Nosocomial (fingerstick devices, etc)
- Most transmissible (HBV>HCV>HIV)

Clinical

- Acute immune complex disease possible
- Diagnose: IgM anti-core, HBsAg and HBV DNA
- New infection vs reactivation (both can be IgM pos)

Acute Viral Hepatitis Delta will be with HBV

- HDV
  - HBV coinfection
  - Fulminant with acute HBV
  - HBV superinfection
  - Acute hepatitis in someone with chronic HBV
  - Test for HDV RNA
37 – Acute Hepatitis  
_Speaker: David Thomas, MD_

### Acute Viral Hepatitis C clues
- HCV
- IDU link (hepatitis in Appalachia)
- HIV pos MSM
- Acute RNA pos but AB neg or pos
- 60-80% persist: more in men, HIV pos, African ancestry, INFL4 gene intact

_Cox CID 2005_

### Hepatitis in a pilot
- 70 y/o pilot presents with 1 week of fever, diarrhea and sweats, then “collapses”
- Tooth extraction 1 month before, E. Shore of Maryland and extensive travel, chelation “treatment”
- T 38.1, 135/70, 85, 18, 97% on 2L; few small nodes, petechial rash on legs, neuro- WNL

### Pilot Case History, con’t
- Hct 33%, WBC 1.4 K (81% P 10% L), Plt 15,000
- Creat 2.8
- AST 495, ALT 159, Alk Phos 47, alb 2.6, TBR 0.8
- CPK 8477
- CXR: infiltrate LLL

### Hepatitis with bacterial infections
1. Think Rickettsia/Ehrlichia with exposure, low PMN, and especially low platelets

### Hepatitis with bacterial infections
2. Coxiella burnetti and spirochetes (syphilis and lepto) also in ddx with liver, lung, renal, skin, CNS disease but tend to be cholestatic vs Rickettsia/Ehrlichia
37 - Acute Hepatitis
Speaker: David Thomas, MD

Hepatitis with bacterial infections
3. Hepatitis F or G are WRONG answers

Hepatitis with travel
Especially remember dengue (below), Chickungunya, or Zika

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<td>0.8-2</td>
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</tr>
</tbody>
</table>

Hepatitis in Pregnancy
• 25yo G1P1 34 wks gestation with 1wk fever, chills, abd pain. 1 wk earlier cephalexin for GpB Strep.
• T 102; other vitals and exam as expected
• Plt 143K; Hb 8.6; WBC 6.4K 20% bands; glucose, creat and INR WNL; ALT 279; AST 643; TB 0.8.
• Hosp day 4: Plt 83K; PT 16; PTT 44; AST 2,240; ALT 980; Br nl; Fibrinogen nl.

Hepatitis in Pregnancy
What is the best diagnosis?
A. HELLP
B. Acute fatty liver of pregnancy
C. Atypical DRESS from cefelexin
D. HSV infection
E. HEV

Hepatitis in Pregnancy
1. Rule out HSV
   ~50% have muco-cutaneous lesions
   High mortality without acyclovir

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Hepatitis in pregnancy

2. HELLP
   - HTN and can occur post partum
   - Fibrinogen high vs. sepsis and AFLP

3. AFLP – severe and low glucose, inc INR, low fibrinogen (Swansea criteria)

Fulminant hepatitis

- 65 year old man with hx of jaundice. 2 weeks before finished amoxicillin/clavulanate acid for sinusitis. Hx of HTN on HCTZ and rosuvastatin. ETOH: 2 drinks per day.
- TB24; ALT 162 U/L; AST 97 U/L ALK P 235 U/L. IgM anti-HAV neg; IgM anti-HBc neg; HCV RNA neg. RUQ US neg.

Drug related liver toxicity

Amoxicillin/clavulanate is most common
- Cholestatic or mixed
- Often AFTER stopping
- 1/2500 Rx
- DRB1*1501
- clavulanate>amoxicillin

Fulminant Hepatitis

Which of the following is the most likely cause of hepatitis:
A. toxicity from amox/clav
B. alcohol
C. porphyria flare
D. leptospirosis
E. statin

Acute hepatitis in HIV

46 y/o HIV pos male, CD4+ lymphocyte 235/ml³, HIV RNA undetect; HBsAg pos; no symptoms on TDF/FTC/RAL. Liver enzymes increased from ALT of 46 to 1041 IU/L. TB was 2.3. He has a long history of various ART regimens. He is sexually active with other men.

Acute hepatitis in HIV

Which of the following is the most likely cause of hepatitis:
A. toxicity from the RAL
B. acute HCV infection
C. IRIS
D. resistant HBV
E. HDV
Recognize acute HCV in HIV POS MSM

Acute Hepatitis Summary
- Acute A: vaccine effective
- HEV: chronic in transplant and/or boar
- HIV: acute HCV in MSM
- Ehrlichial or rickettsial
- Find the lepto case (jaundice>hepatitis)

Thanks and good luck on the test!
Questions:
Dave Thomas
• dthomas@jhmi.edu

BREAK
slides beyond this are for the presenter’s records; not to be distributed or shown

Case 6. Hepatitis in Pregnancy
- 24yo 33 wks gestation with nausea and vomiting and RUQ pain. Taking acetaminophen 1gm q8; has dog and bird; recent visit to mom in NC.
- T 37.2; BP 158/110;2/6 SEM; RUQ tender; no rash.
- Plt 103K; Hct 6; WBC 6.6 10%L; PMN 82%; G 85; creat 0.6; ALT 225; AST 559; TB 1.4; CRP 15.8; PT WNL; fibrinogen NL.
Case 4: Tired and jaundiced
- 27 year old male presents with fatigue and dark urine. Hx recent sexual exposures with other men.
- No fever, vitals normal. Mild icteric. ALT 1945 IU/ml; AST 1239 IU/ml; TB 4.2 mg/dl; WBC 3.2k nl diff.
- Total HAV pos; HAV IgM neg; HCV RNA neg; IgM anti-HBc pos; HBsAg pos; RPR neg; HIV 4th gen neg
- Ptk was tested and is HBsAg and anti-HBs neg

Question #4
Which is easiest to justify medically?
A. Repeat HBsAg and anti-HBs testing for partner
B. HBIG and HBV vaccine for partner
C. HBV vaccine for partner
D. Entecavir 0.5 mg/d for patient
E. TAF for partner

Diagnose acute HBV infection with IgM anti-HBc

2. No treatment indicated for acute HBV (unless fulminant)

3. Prevention by vaccine +/- HBIG
- HBsAg and anti-HBs screening of partners
- Tools: HBIG and/or HBV vaccine (USA)
  - Engerix, Recombivax, Heplisav-B, Pediargix, Twinrix
- Post-exposure:
  - Vaccinated and anti-HBs >10 ever, done*
  - No hx vaccine and/or anti-HBs >10, HBIG and vaccinate

3. Prevention by vaccine +/- HBIG con’t
- Pre-exposure:
  - no vaccine hx – vaccinate
  - Vaccine hx no testing – test for anti-HBs, boost or revaccinate if neg, retest anti-HBs

48 1 2 1 6 20 24 28 32 36 52 100
Source: CDC and Prevention

*may be exception for patients with immunosupression like HIV or dialysis

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