Hepatitis B Project ECHO

Feb. 25th, 2021
12pm Eastern Time
Reoccurring every 4th Thursday
Agenda

Project ECHO Defined and Session Format (2 minutes) Catherine Freeland

Introductions (10 minutes)

Didactic Presentation: Hepatitis B Testing (15 minutes) Jon Fenkel MD
  ◦ At the end of the session, participants will have an understanding of hepatitis B testing and serology interpretation.

Case Presentation (5-10 minutes) Jody Gilmore MSN, CRNP, PPMC

Case Feedback and Recommendations (15 minutes)
The ECHO Model

A. Amplification – Use Technology to leverage scarce resources

B. Share Best Practices to reduce disparity

C. Case Based Learning to master complexity

D. Web-based Database to Monitor Outcomes
Introductions

Name, Affiliation
HBV ECHO:  
Hepatitis B Testing Overview  
February 25, 2021

Jonathan Fenkel, MD, FACP  
Director, Jefferson Hepatitis C Center  
Associate Medical Director of Liver Transplantation  
Thomas Jefferson University Hospital  
Associate Professor of Medicine  
Sidney Kimmel Medical College at Thomas Jefferson University
Disclosures

Consultant: Gilead

There WILL NOT be discussion of off-label usage
There WILL NOT be discussion of investigational agents
Lecture Outline

• Who should be tested?
• What tests do we use to screen?
• What tests do we use to determine who needs treatment?
• What tests do we use to monitor a patient on treatment?
Case Presentation

- 19 y/o female presents for new patient H&P
  - Feels well, no complaints
  - Former Burmese refugee, lived in US since age 12
  - Starting college in the fall
  - Lives with 8 other relatives & friends

*What is the likelihood of this patient having HBV?
HBV Geographic Prevalence

HBsAg Prevalence

- > 8% - High
- 2-7% - Intermediate
- < 2% - Low
Who should be tested?

• AASLD/USPSTF: Risk factor-based screening for non-pregnant women
  • Most common:
    • Patient or parents born in country w/ prevalence >2%
    • Multiple sexual partners
    • Coinfected with HIV or HCV
    • IVDU
  • All Pregnant Women should be screened
  • CDC and ACOG recommend HBV screening at initial prenatal visit with Hep B sAg testing
    • If + → eAg, DNA quant, ALT
### TABLE 3. Groups at High Risk for HBV Infection Who Should Be Screened

- Persons born in regions of high or intermediate HBV endemicity (HBSAg prevalence of ≥2%)
  - Africa (all countries)
  - North, Southeast, East Asia (all countries)
  - Australia and South Pacific (all countries except Australia and New Zealand)
  - Middle East (all countries except Cyprus and Israel)
  - Eastern Europe (all countries except Hungary)
  - Western Europe (Mediterranean, and indigenous populations of Greenland)
  - North America (Alaskan natives and indigenous populations of Northern Canada)
  - Mexico and Central America (Guatemala and Honduras)
  - South America (Ecuador, Guyana, Suriname, Venezuela, and Amazonian areas)
  - Caribbean (Antigua-Barbuda, Dominica, Grenada, Haiti, Jamaica, Saint Kitts and Nevis, Saint Lucia, and Turks and Caicos Islands)
- U.S.-born persons not vaccinated as an infant whose parents were born in regions with high HBV endemicity (≥8%)*
- Persons who have ever injected drugs*
- Men who have sex with men*
- Persons needing immunosuppressive therapy, including chemotherapy, immunosuppression related to organ transplantation, and immunosuppression for rheumatological or gastroenterologic disorders.
- Individuals with elevated ALT or AST of unknown etiology*
- Donors of blood, plasma, organs, tissues, or semen
- Persons with end-stage renal disease, including predialysis, hemodialysis, peritoneal dialysis, and home dialysis patients*
- All pregnant women
- Infants born to HBsAg-positive mothers*
- Persons with chronic liver disease, e.g., HCV*
- Persons with HIV*
- Household, needle-sharing, and sexual contacts of HBsAg-positive persons*
- Persons who are not in a long-term, mutually monogamous relationship (e.g., >1 sex partner during the previous 6 months)*
- Persons seeking evaluation or treatment for a sexually transmitted disease*
- Health care and public safety workers at risk for occupational exposure to blood or blood-contaminated body fluids*
- Residents and staff of facilities for developmentally disabled persons*
- Travelers to countries with intermediate or high prevalence of HBV infection*
- Persons who are the source of blood or body fluid exposures that might require postexposure prophylaxis
- Inmates of correctional facilities*
- Unvaccinated persons with diabetes who are aged 19 through 59 years (discretion of clinician for unvaccinated adults with diabetes who are aged ≥60 years)*

*Indicates those who should receive hepatitis B vaccine, if seronegative.
What tests do we use to screen?

1. **HBsAg (Hepatitis B surface antigen)** - A "positive" or "reactive" HBsAg test result means that the person is infected with hepatitis B.

2. **anti-HBs or HBsAb (Hepatitis B surface antibody)** - A "positive" or "reactive" anti-HBs (or HBsAb) test result indicates that a person is protected against the hepatitis B virus.

3. **anti-HBc or HBcAb (Hepatitis B core antibody)** - A "positive" or "reactive" anti-HBc (or HBcAb) test result indicates a past or current hepatitis B infection.
Other Testing Tips

• **Anti-HBc IgM and IgG (total) testing** can usually indicate what type of HBV infection - acute vs. chronic
  • IgM = Recent (Acute) infection
  • IgG = Chronic infection

• **HBeAg and HBeAb** (hepatitis B e Antigen / Antibody)
  • Useful to have if chronic infection confirmed to guide treatment decisions
  • eAg usually present in early infection and is associated with increased viral replication (higher viral loads)

• **HBV DNA quantitative PCR** (aka viral load)
  • Measures amount of virus in the blood
  • Useful to guide treatment decisions and HCC risk
## Serologic Response to HBV Infection

<table>
<thead>
<tr>
<th></th>
<th>Acute</th>
<th>Recovery</th>
<th>Chronic</th>
<th>Vaccine</th>
</tr>
</thead>
<tbody>
<tr>
<td>HBsAg</td>
<td>+</td>
<td>-</td>
<td>+ (x6mo)</td>
<td>-</td>
</tr>
<tr>
<td>HBsAb</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>HBeAg</td>
<td>+</td>
<td>-</td>
<td>+/-</td>
<td>-</td>
</tr>
<tr>
<td>HBeAb</td>
<td>-</td>
<td>+</td>
<td>+/-</td>
<td>-</td>
</tr>
<tr>
<td>DNA</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>HBcAb</td>
<td>IgM</td>
<td>IgG</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>HBsAg (Total or IgG)</td>
<td>Anti-HBc</td>
<td>Anti-HBs</td>
<td>Interpretation</td>
<td>Management</td>
</tr>
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</tbody>
</table>
| +                    | +        | −/+     | Current infection | [See Evaluation, Counseling, Management, Treatment, and HCC Surveillance (pages 4, 5, 6, 7)]  
[Refer household and sexual contacts for HBV screening; if susceptible, vaccinate] |
| −                    | +        | +       | Prior infection with immune control | [No transmission risk; HBV dormant in liver]  
[Reactivation risk if on immunosuppressive medications] |
| −                    | +        | −       | Prior infection or occult infection<sup>1</sup> | [If immunocompetent<sup>2</sup>, counsel as prior infection above]  
[Reactivation risk if on immunosuppressive medications]  
[If immunocompromised, check HBV DNA for occult infection<sup>3</sup>] |
| −                    | −        | +       | Immune from prior vaccination | Protected for life. No need for booster vaccine |
| −                    | −        | −       | Susceptible | VACCINATE<sup>3</sup> |

<sup>1</sup> Occult infection is not typically diagnosed clinically but may be identified through blood testing.  
<sup>2</sup> Immunocompetent means the person has a healthy immune system.  
<sup>3</sup> Vaccination is recommended to prevent future infection.
Chronic HBV Classification

- Preferred terminology has changed in past few years
- In US, we now use:
  - **Immune-tolerant chronic HBV**
    - eAg+, high viral load, normal liver enzymes
    - No significant liver inflammation or fibrosis
  - **Immune-active chronic HBV**
    - eAg+ or eAg-
    - Viral load >20,000 IU/mL in eAg+, >2000 IU/ml in eAg -
    - Intermittent or persistent elevated liver enzymes
    - Moderate/severe liver inflammation +/- fibrosis
  - **Inactive chronic HBV**
    - Low viral load (<2000 IU/mL); Normal liver enzymes
    - eAg - / eAb+; No significant fibrosis
- European Guidelines use terminology of “chronic infection” and “chronic hepatitis” both possible in eAg+ or eAg- pts

What tests do we use to determine who needs treatment?

• Need to know 4 things to decide if Rx needed
  • e-Antigen status
  • Liver enzymes (ALT)
  • Viral load
  • Cirrhosis?

• Other helpful things:
  • Fibrosis stage; coinfection status (C/D/HIV); CKD? FHX HCC/cirrhosis? transplant? Osteopenia?
Treatment Recommendations

**A**

**HBsAg-positive**

**HBeAg-positive**

- **ALT ≤ULN**
  - HBV DNA >20,000 IU/mL
  - **Note:** HBV DNA 2000-20,000 IU/mL may represent seroconversion, so monitor every 1-3 months and if persists for >6 months, treat.

- **ALT >ULN but <2XULN**
  - HBV DNA >20,000 IU/mL

- **ALT ≥2XULN**
  - HBV DNA >20,000 IU/mL
  - **Note:** HBV DNA 2000-20,000 IU/mL may represent seroconversion, so monitor every 1-3 months and if persists for >6 months, treat.

**Recommendations:**

- **Treat**

- **Do not treat.** Monitor with ALT and HBV DNA levels every 3-6 months and HBeAg every 6-12 months.

Exclude other causes of ALT elevation and assess disease severity with non-invasive tests and/or liver biopsy. If staging indicates ≥F2 or ≥A3, treat. If other causes of ALT >ULN excluded and elevation persists, treat, especially if age >40.
Treatment Recommendations

B

HBsAg-positive

HBeAg-negative

ALT ≤ULN*

HBV DNA ≥2000 IU/mL

HBV DNA <2000 IU/mL

ALT >ULN but <2XULN*

HBV DNA ≥2000 IU/mL

HBV DNA <2000 IU/mL

ALT ≥2XULN*

HBV DNA ≥2000 IU/mL

HBV DNA <2000 IU/mL

Recommendations:

Treat

Do not treat. Monitor with ALT and HBV DNA levels every 3-6 months and HBsAg annually.

If ALT ≤ULN, monitor ALT and HBV DNA every 3 months for 1 year, then every 6 months.
If ALT elevated, exclude other causes of ALT elevation and assess disease severity with non-invasive tests and/or liver biopsy. If staging indicates ≥F2 or ≥A3, treat. If persistent ALT >ULN with HBV DNA ≥2000 IU/mL, treat, especially if age >40.
What tests do we use to monitor a patient on treatment?

- Labs: CMP, HBV DNA every 3-6 months
- Some medications require dose adjustment if renal dysfunction present
- Hepatocellular carcinoma (HCC) screening per guidelines
- If liver tests or DNA rise while on treatment:
  - Assess for adherence
  - Check for HDV superinfection
  - Check for HIV or HCV coinfection
  - Assess for other new medications or supplements that may cause liver injury
Take Home Points

- Screen all patients born outside US or whose parents were born outside US in a country with 2%+ prevalence for hep B
- Screen patients with risk factors for HBV
- Screening tests of choice for patients at risk are HBsAg, HBcAb and HBsAb
- To determine need for treatment check HBeAg/eAb, DNA quantitative PCR, ALT, and imaging to look for cirrhosis
- On treatment - monitor CMP+DNA & HCC screening
Contact Information

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Hepatitis B Case Presentation

Jody Gilmore MSN, CRNP, PPMC
Call for cases:

Please email Catherine.Freeland@hepb.org if you would like to submit a case for presentation.

CME Credit:

Post-Assessment: https://www.surveymonkey.com/r/6V2XHVJ