The Hepatitis B-e antigen-positive Dental Student

Developing an Equitable Policy

Hepatitis B Virus Serology
HBsAg

- A protein on the surface of HBV; it can be detected in high levels in serum during acute or chronic HBV infection.

anti-HBs

- generally interpreted as indicating recovery and immunity from HBV infection. Anti-HBs also develops in a person who has been successfully vaccinated against hepatitis B.
anti-HBc

- Appears at the onset of symptoms in acute hepatitis B and persists for life.

IgM anti-HBc

- Indicates recent infection with HBV (≤6 months). Its presence indicates acute infection.
HBeAg

- presence indicates that the virus is replicating and the infected person has high levels of HBV.

HBeAb or anti-HBe

- Produced by the immune system temporarily during acute HBV infection or consistently during or after a burst in viral replication. Spontaneous conversion from e antigen to e antibody (a change known as seroconversion) is a predictor of long-term clearance of HBV in patients undergoing antiviral therapy and indicates lower levels of HBV.
CDC Recommendations

- MMWR July 12, 1991
  - Universal precautions
  - No restrictions for invasive procedures not identified as exposure-prone
  - Exposure-prone procedures defined by facility
  - HCWs that perform those procedures should know their HIV and HBV status
    - Counseling by expert review panel for these HIV and HBeAg positive HCWs

CDC Recommendations

- Mandatory testing not recommended
- Notification of patients determined case-by-case
- Additional needs:
  - Define nature, frequency and circumstances of blood contact during invasive procedures
  - Evaluate safer devices and techniques
  - Improve sterilization/disinfection techniques
  - Identify factors influencing HIV and HBV transmission
EPP’s Defined

- “In practice, EPP’s are invasive procedures where the skin of the HCW may come into contact with sharp surgical instruments, needles or sharp tissues in body cavities or poorly visualized, confined body sites.”

J Vir Hep 2006 13, 2-4

EPP’s in Dentistry?
Implementing CDC Guidelines in a Dental School

- All students must perform invasive procedures (are these exposure-prone?)
- Patient rights to safe care override student’s right to an education
- Low number of reported DHCP to patient transmission since the 1980’s
- Impact of finding out a student is HBeAg+ later in their education rather than before matriculation

Recent Scientific Literature

- Annals of Internal Medicine
  - Nonhospital transmission of HBV and HCV in U.S. 1998-2008
  - 33 outbreaks
  - 448 transmissions
  - Patient-to-patient transmissions
    - Only included outbreaks that involved 2 or more patients and where epidemiological link to facility could be established.
Recent Scientific Literature

• 1996: NEJM
• Thoracic surgery resident with history of recent hepatitis B infection
• Assisted in 144 surgeries
• Infected 19 patients
• No observed or reported breaches in infection control
• HBeAg-positive and high serum HBV DNA

Recent Scientific Literature

• 1997 NEJM
• Transmission of HBV by 4 surgeons
• None were HBeAg-positive (all were positive for Anti-HBe)
• All were chronically infected and had mutations of the precore that prevents transcription of the precore region and therefore the expression of HBeAg.
• Significance of the mutation is uncertain.
Recent Scientific Literature

- HBV DNA
  - High levels implicated in transmission without the presence of HBeAg
  - No international standardization of interpretation of HBV DNA results
- HBV Genotype
  - What role in transmission risk?
- Other factors influencing risk
  - Amount of infectious body fluid

Treatment of HBeAg-positive Individuals

- Successful reduction in both detection of e-antigen and HBV DNA levels using Interferon-alpha and antivirals
- May require long-term treatment
- Can experience rebound months or years following treatment
Scientific Recommendations
Post-CDC Guidelines

European consensus panel

- Primarily addresses vaccination
- Brief discussion of infected HCWs
  - Counsel workers regarding prevention and medical care
  - Evaluation by expert review panel according to recommendations
SHEA position paper (1997)

- Separate virus-specific management strategies
- Double gloving for HBeAg workers
- Exclusion from activities epidemiologically associated with risk of transmission despite infection control precautions
- Manage infected workers the same as other impaired workers, including reasonable accommodations

Implications for Educational Institutions

- Should students be handled differently than established health-care providers?
- Should schools screen prospective students?
- What are the ADA and other legal implications?
- If an expert panel is convened and determines a student may not continue, does that affect policy for all students?
Policy Options

- Do nothing; don’t ask and if discovered take no action.
- Encourage voluntary disclosure, convene expert review panel if disclosed
  - Identify EPP
- Require testing, convene panel for HBeAg
- Screen applicants, refuse admission unless treated and status resolves

Additional Issues

- Application of ethical principles
- Liability
- Patient’s rights (or perceived rights)
- American’s with Disabilities Act (ADA)
- Practice restrictions
- Treatment rebound effect