Clark County Health District · Office of Epidemiology

Epidemiology Newsletter

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CLARK COUNTY HEALTH DISTRICT

February 2003 - Interpretation of Hepatitis B Laboratory Results

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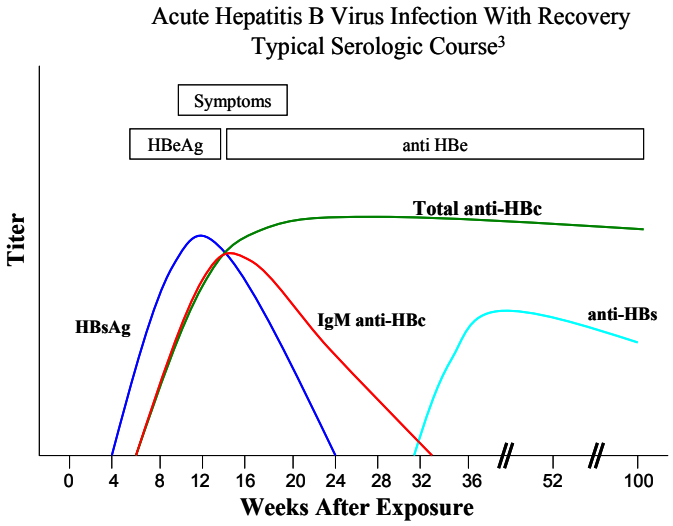
Our previous issue of the Epidemiology Newsletter addressed Hepatitis A. This issue examines Hepatitis B, a structurally more complex virus leading to a more complex clinical presentation. The hepatitis B virus (HBV) is a small 42-nm virus consisting of numerous antigenic components, including a core antigen (HbcAg), the hepatitis *e* antigen (HBeAg), and the surrounding surface antigen (HBsAg). Ordering the proper test for these antigens or their antibodies can help differentiate the stage of the disease, assisting with treatment decisions as well as with protection of contacts.

Clinically, acute hepatitis B is similar to other types of viral hepatitis. Although clinical symptoms appear more often in adults than in children, approximately 50% of adults with acute infections are asymptomatic. Unlike hepatitis A, approximately 6-10% of adults infected with HBV and as many as 90% of infants acquiring HBV from their mothers will become chronic carriers of HBV[1]. People with chronic infections usually remain asymptomatic for years and may not be aware they are infected but are still potentially infectious to others.

The first serologic evidence of HBV infection is the HBsAg which is detectible in the blood 1-10 weeks after exposure to HBV and disappears 4-6 months after exposure (see figure). Persistence of HBsAg for longer than 6 months is indicative of chronic infection. The test for HBsAg is included in most hepatitis screening panels.

The appearance of Anti-HBc coincides approximately with the onset of symptoms and persists indefinitely. There may be a period of time after HBsAg disappears and before the appearance of anti-HBs during which anti-HBc is the only serologic evidence of a HBV infection. IgM anti-HBc does not persist during chronic infection (except during episodes of reactivation) and is therefore the best single serologic test to differentiate an acute from a chronic infection. This is included only in the Hepatitis Acute Profile at



Quest Diagnostics (Test Code #365). It should be noted that total Anti-HBc is not a specific indicator of infection as it may be elevated following vaccination and will persist indefinitely following natural infection. If a hepatitis panel such as the comprehensive panel is ordered to screen for hepatitis A, B, and C viruses, and HBV is suspected, CCHD recommends that physicians also order the IgM Anti-HBc test (Test Code #1810). The table on the next page provides an easy to use interpretation of the HBV serologic markers.

HBeAg is contained in the core of HBV and can be detected in the serum if high virus concentrations exist, indicating high infectivity to others. Serological tests for HBeAg are ordered through Quest Diagnostics using test code #7820. This test is not useful for diagnostic or screening purposes.

The incidence of hepatitis B cases nationwide peaked in the mid-1980s and has declined since then. This decline has been attributed to a decrease in transmission among IV drug users and men who have sex with men (MSM), resulting directly from HIV prevention strategies. Data suggests that hepatitis B reporting is incomplete and that there may

HEPATITIS B PANEL RESULTS[3]

Tests	Results	Interpretation
HBsAg anti-HBc anti-HBs	negative negative negative	susceptible
HBsAg anti-HBc anti-HBs	negative positive positive	immune due to natural infection
HBsAg anti-HBc anti-HBs	negative negative positive	immune due to hep B vaccine
HBsAg anti-HBc IgM anti-HBc anti-HBs	positive positive positive negative	acutely infected
HBsAg anti-HBc IgM anti-HBc anti-HBs	positive positive negative negative	chronically Infected
HBsAg anti-HBc anti-HBs	negative positive negative	four interpretations possible*

* 1. May be recovering from acute HBV infection
2. May be distantly immune and test not sensitive enough to detect very low leverl of anti-HBs in serum.
3. May be susceptible with a false positive anti-HBc
4. May be undetectable level of HBsAg present in the serum and person is actually a carrier.

be as many as 100,000-125,000 new cases in the United States each year and approximately one million chronically infected people[1]. Currently, the most common risk factor for HBV infection is heterosexual contact, followed by MSM. Injection drug users and household contacts of chronic carriers are also at risk. Approximately 25% of hepatitis B cases have no known risk factors. Any patient diagnosed with hepatitis B should be advised to receive the hepatitis A vaccine, also available at CCHD, to protect the liver against further insult.

For public health protection, it is important to identify chronic carriers. Sexual and other household contacts of any patient with HBV, and especially of chronic carriers, should receive the hepatitis B vaccine, available from CCHD[2]. Because of the long incubation period (up to 6 months), the vaccine is considered appropriate prophylaxis if given soon after exposure. Hepatitis B immunoglobulin (HBIg) is not available through CCHD.

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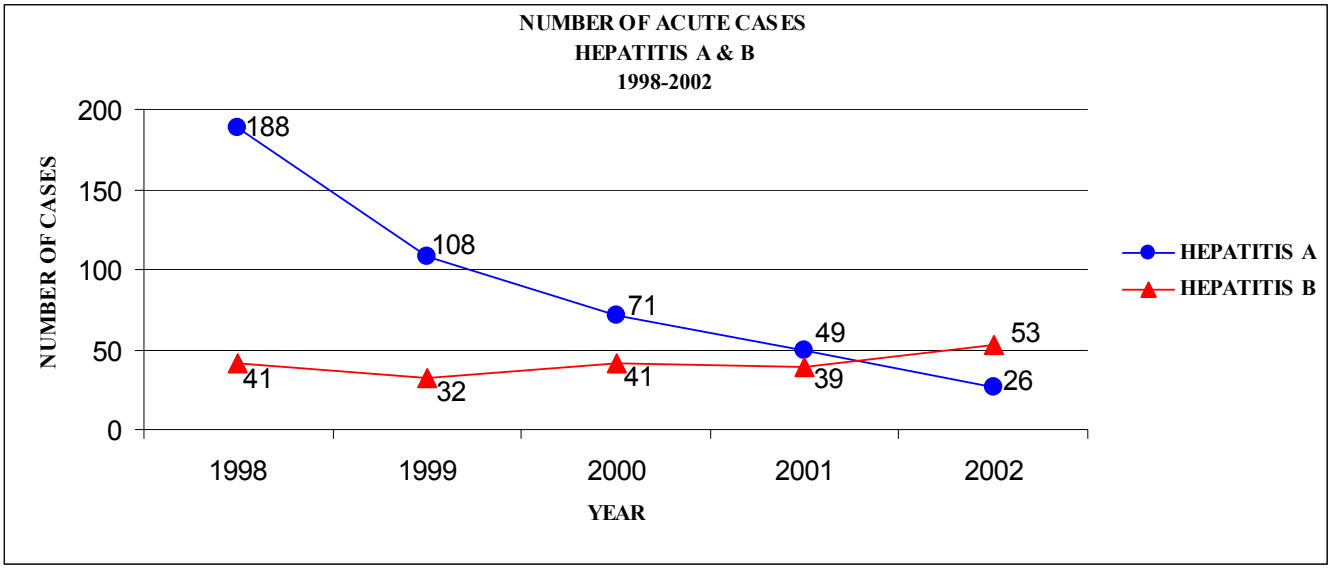

[1]Centers for Disease Control and Prevention (CDC) Epidemiology and prevention of vaccine-preventable diseases. 5th ed. Washington DC: Public Health Foundation, 1999
[2]Chin J.Control of Communicable Diseases manual. 17th ed. Washington DC: American Public Health Association, 2000.
[3]Centers for Disease Control and Prevention (CDC). http://www.cdc.gov/ncidod/diseases/hepatitis/b/index.htm