HEPATITIS B - PREVENTION, DIAGNOSIS AND CARE: A REVIEW

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ABSTRACT: Hepatitis B virus (HBV) infection is a major cause of morbidity and mortality worldwide. Hepatitis B is spread through contact with blood or body fluids of an infected person.
Hepatitis B virus (HBV) is the major cause of chronic hepatitis, cirrhosis, and hepatocellular carcinoma. The likelihood of developing Chronic Hepatitis B is related to the age at which infection is acquired; the risk being lowest in adults and >90% in neonates whose mothers are hepatitis B e antigen positive. HBV is not directly cytopathic and liver injury appears to be mostly caused by repeated attempts of the host's immune responses to control the infection. After reviewing the various articles, the following protocols are best suited for the health care workers.

KEY WORDS: Hepatitis B virus, chronic hepatitis, hepatocellular carcinoma.

INTRODUCTION: Our understanding of the natural history of hepatitis B virus (HBV) infection and the potential for therapy of the resultant disease is continuously improving.Hepatitis B is the most common serious liver infection in the world. It is caused by thehepatitis B virus (HBV) that attacks liver cells and can lead to liver failure, cirrhosis(scarring) or cancer of the liver. Most people are able to fight off a hepatitis B infection and clear the virus from their blood. This may take up to six months. While the virus is present in their blood, infected people can pass the virus on to others.Acute (primary) HBV infection is frequently unrecognized: approximately 30% of infected individuals experience mild symptoms lasting a few weeks which are commonly mistaken for the flu or other mild viral infections. Fulminant hepatitis occurs in less than 2% of infected individuals, which is often fatal.Approximately 5-10% of adults, 30-50% of children, and 90% of babies will not get rid ofthe virus and will develop chronic infection.1chronically infected people can pass the virus on to others and are at increased risk for liver problems later in life.

Chronic infection can lead to liver damage (inflammation, fibrosis, and cirrhosis), and can ultimately result in liver failure or hepatocellular carcinoma (HCC).[2]

Between 15% to 40% of chronically infected individuals will suffer significant symptoms in their lifetime, and up to 25% will die from directly related causes.The hepatitis B virus is 100 times more infectious than the AIDS virus. Yet, hepatitis B can be prevented with a safe and effective vaccine.

The objective of this manuscript is to update the recommendations for the optimalmanagement of chronic HBV infection.

DISCUSSION:

Route of spread of infection:

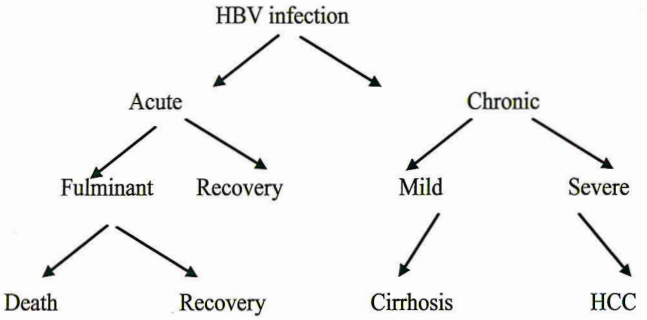
The main routes of infection are

- Sexual contact
- Contaminated injectionsand transfusions
- Perinatal transmission
- Child-to-child transmission

(horizontal ingeographical regions of high endemicity)

- Human bites
- Living in a household with an infected person
- An infected mother to her newborn child at birth
- Sharing earrings, razors, or toothbrushes with an infected person

Spectrum of liver disease after HBV infection



Clinical phases of acute Hepatitis B

The acute form of the disease often resolves spontaneously after a 4 – 8 week illness. Most patients recover without significant consequences & recurrence.Children under age 5 years rarely have symptoms1. When people have symptoms, they usually appear between 60 and 150 days after onset of infection.

Symptoms of hepatitis B might include the following:

The onset is insidious with,

- Loss of appetite or nausea
- Bloated and tender belly
- Extreme tiredness
- Fever – mild / absent
- Pain in joints
- Tiredness
- Anorexia
- Vomiting often progressing to jaundice.

The icteric phase usually begins within 10 days of the initial symptoms with the appearance of the dark urine, followed by pale stools& yellowish discolouration of the mucous membranes, conjunctivae, sclera& skin. Jaundice becomes apparent clinically when the total bilirubin level exceeds 20-40mg/l. It is accompanied by hepatomegaly &spleenomegaly. About 4-12 weeks the jaundice disappears & the illness resolves with the development of natural protective antibodies.

Clinical phases of chronic Hepatitis B

Chronic hepatitis generally develops over many years during which individual patients pass through a number of disease states. Surprisingly few patients may not have clinical & biochemical evidence of liver disease, while others may show signs of easy fatigability, anorexia, malaise & anxiety.

3 phases of viral replication occur during the course of HBV infection in chronic hepatitis B3.

1: **High replicative phase** – in this phase HBsAg, HBeAg& HBV DNA are present & detectable in sera. Aminotransferase levels may increase. Risk of evolving to cirrhosis is high.

2: **Low replicative phase:** it is associated with loss of HBeAg or a decrease or loss of HBV DNA concentrations & with appearance of anti HBe.

3: Non replicative phase: Markers of viral replication are either absent or below detection level & the inflammation is diminished.

Prevention:

Immunisation with hepatitis B vaccine is the most effective means of preventing infection & its consequences.The CDC and the American Academy of Pediatrics recommendthat all infants, children and adolescents up to age 18 receive the HBV vaccine. Thevaccine is also recommended for all adults who may be at high risk for infection4.

Hepatitis vaccine:

The first hepatitis B vaccine became commercially avail¬able in the United States in 1982. In 1986, a hepatitis B vaccine produced by recombinant DNA technology was licensed, and a second recombinant-type hepatitis B vaccine was licensed in 1989. The two recombinant DNA vaccines (Recombivax HB and Engerix-B) are the only hepatitis B vaccine preparations currently used in the United States. Hepatitis B vaccine, usually a three-dose series, is recommended for all children 0 through 18 years of age. It is recommended for infants beginning at birth in the hospital. Adolescents who are just starting their series will need two or three doses, depending on their age and the brand of vaccine used.

RECOMBIVAX HB® Hepatitis B Vaccine (Recombinant) is a non-infectious subunit viral vaccine derived from hepatitis B surface antigen (HBsAg) produced in yeast cells.

RECOMBIVAX HB Hepatitis B Vaccine (Recombinant) is supplied in three formulations4.

Pediatric/Adolescent Formulation (Without Preservative), 10mcg/mL: each 0.5 mL dose contains 5 mcg of hepatitis B surface antigen.

Adult Formulation (Without Preservative), 10mcg/mL: each 1 mL dose contains 10 mcg of hepatitis B surface antigen.

Adult Formulation (Without Preservative), 10mcg/mL: each 1 mL dose contains 10 mcg of hepatitis B surface antigen.

Dialysis Formulation (Without Preservative), 40mcg/mL: each 1 mL dose contains 40 mcg of hepatitis B surface antigen.

All formulations contain approximately 0.5 mg of aluminium per mL of vaccine. In each formulation, hepatitis B surface antigen is adsorbed onto approximately 0.5 mg of aluminumper mL of vaccine. The vaccine contains <15 mcg/mL residual formaldehyde. RECOMBIVAX HB Dialysis Formulation is indicated for vaccination of adult predialysis and dialysis patients against infection caused by all known subtypes of hepatitis B virus.

Administration of vaccine:

It is given by intramuscular in the anterolateral aspect of the thigh (infants) or deltoid muscle (older children) [5].

The standard vaccination protocol for children and adults is

1. First injection at any time
2. Second injection at least 1 month after the first dose
3. Third injection 6 months after the first dose

For infants born to mothers positive for HBsAg, the first dose of vaccine should be given within 12 hours of birth along with administration of HBIg. The second dose should be given at 1 to 2 months of age, and the third dose at 6 months of age[4].

Which Health care workers need serologic testing after receiving 3 doses of hepatitis B vaccine?

All HCWs should have serologic testing 1–2months following the final dose of the hepatitis Bvaccine series. An anti-HBs serologic test result of >10mIU/mL indicates immunity. No further routinedoses or testing is indicated6

DIAGNOSIS: The tests, called assays, for detection of hepatitis B virus infection involve serum or blood tests that detect either viral antigens (proteins produced by the virus) or antibodies produced by the host. The hepatitis B surface antigen (HBsAg) is most frequently used to screen for the presence of this infection. It is the first detectable viral antigen to appear during infection. However, early in an infection, this antigen may not be present and it may be undetectable later in the infection as it is being cleared by the host. During this 'window' in which the host remains infected but is successfully clearing the virus, IgM antibodies to the hepatitis B core antigen (anti-HBcIgM) may be the only serological evidence of disease. Therefore most hepatitis B diagnostic panels contain HBsAg and total anti-HBc (both IgM and IgG).The time between the removal of the HBsAg and the appearance of anti-HBs is called the window period2. A person negative for HBsAg but positive for anti-HBs either have cleared an infection or have been vaccinated previously.Individuals who remain HBsAg positive for at least six months are considered to be hepatitis B carriers. Carriers of the virus may have chronic hepatitis B, which would be reflected by elevated serum alanine aminotransferase (ALT) levels and inflammation of the liver, as revealed by biopsy. PCR tests have been developed to detect and measure the amount of HBV DNA, called the viral load, in clinical specimens6. These tests are used to assess a person's infection status and to monitor treatment. Individuals with high viral loads, characteristically have ground glass hepatocytes on biopsy.

CONCLUSION: Chronic hepatitis B infection continues to challenge public health efforts worldwide. Addressing the disease burden associated with chronic infection is complicated by the lack of a generally effective cure. Disease management is often lifelong, with many cases leading to liver disease, liver failure, or cancer. Screening in health care workers can significantly reduce the risk of transmission by identifying need of vaccination and immune therapy. Screening and patient care can benefit from a range of testing modalities that utilize both serologic and molecular tests.

Table: 1

Recommendations ForPostexposure Prophylaxis After Percutaneous Or Mucosal Exposure To HBV In An Occupational Setting

	Treatment			
Vaccination & antibody response status of exposed persons	**Source is HBsAg positive**	**Source is HBsAg negative**	**Source isunknown or not tested**	
			High risk	**Low risk**
Unvaccinated	HBIG (1dose) & begin a Hepatitis B vaccine series	Begin a Hepatitis B vaccine series	Begin a Hepatitis B vaccine series	Begin a Hepatitis B vaccine series
Known responder	No treatment	No treatment	No treatment	No treatment
Nonresponder				
Not revaccinated	HBIG (1dose) & begin a revaccination series	Begin a revaccination series	HBIG (1dose) & begin a revaccination series	Begin a revaccination series
After revaccination	HBIG (2doses)	No treatment	HBIG (2doses)	No treatment
Antibody response unknown	Tests for anti –HBs If adequate, no treatment If inadequate, HBIG x 1 & vaccine booster	No treatment	Tests for anti – HBs If adequate, no treatment If inadequate, give vaccine booster & check anti HBs in 1-2 months	

REFERENCES:

1. Robinson, W.S.: Hepatitis B Virus and the Delta Virus, in "Principles and Practice of Infectious Diseases," G.L. Mandell; R.G. Douglas; J.E. Bennett (eds), vol. 2, New York, John Wiley & Sons, 1002-1029, 1985.
2. Balistreri, W.F.: Viral Hepatitis, Unique Aspects of Infection during Childhood, Consultant 24(4): 131-153 passim, April 1984.
3. Robinson, W.S.: Hepatitis B Virus and Hepatitis Delta Virus, in "Principles and Practice of Infectious Diseases," G.L. Mandell, R.G. Douglas, and J.E. Bennett (eds), Churchill Livingstone, 1204-1231, 1990.
4. Universal Hepatitis B Immunization, Committee on Infectious Diseases, Pediatrics89(4): 795-800, 1992.
5. Francis, D.P.; Hadler, S.C.; Thompson, S.E., et al.: The Prevention of Hepatitis B with Vaccine. Report of the Centers for Disease Control Multi-center Efficacy Trial among Homosexual Men. Ann. Int. Med. 97: 362-366, 1982.
6. American Academy of Pediatrics (2003) Active immunization. In: Pickering LK (ed.) Red Book: 2003 Report of the Committee on Infectious Diseases, 26th edition. Elk Grove Village, IL: American Academy of Pediatrics, p 33.

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