HEPATITIS B

Disease Overview

Hepatitis B is a serious viral infection of the liver caused by the hepatitis B virus (HBV). The majority of individuals infected with the virus naturally produce antibodies to clear the disease however, some individuals fail to produce an adequate immune response leading to chronic disease. After acute HBV infection, the risk of developing chronic infection varies inversely with age.

Hepatitis D also known as "delta hepatitis," is a liver infection caused by the Hepatitis D virus (HDV). Hepatitis D only occurs among people who are infected with the Hepatitis B virus because HDV is an incomplete virus that requires HBV to replicate. HDV can be an acute, short-term, infection or a long-term, chronic infection. Hepatitis D and can be acquired either as a coinfection with HBV or as superinfection in people with HBV infection. Infection with HDV in HBV infected individuals is associated with more severe and/or progressive liver disease than is HBV infection.

Symptoms

Initial infection with HBV may be asymptomatic in up to 50% of adults and 90% of children. Symptoms may include jaundice, malaise, anorexia, nausea, vomiting, myalgia, rash and arthralgia. Fever may be absent or mild. Acute illness may last up to three months. Acute infection **cannot** be distinguished from other forms of acute viral hepatitis on the basis of clinical signs and symptoms or non-specific laboratory findings. Chronic infections may present with disease flare-ups with similar symptoms and signs.

HDV onset is usually abrupt, with signs and symptoms resembling those of hepatitis B; may be severe. Acute HDV can be misdiagnosed as an exacerbation of chronic HBV.

Mode of Transmission

The HBV virus may be transmitted from individuals with acute or chronic infection (asymptomatic or symptomatic). Hepatitis B is mainly spread through blood and body fluids (vaginal secretions, semen, and serous fluids) of an infected individual. Transmission of HBV may also occur with activities involving percutaneous exposure (IV, IM, SC or intradermal) and the use of contaminated equipment. In Canada the risk of transfusion related HBV infection is extremely low as all blood and blood products are tested. Saliva is considered infectious in bite wounds with broken skin involving the inoculation of saliva, or when it is visibly tainted with blood.

HBV is stable on environmental surfaces in blood for at least 7 days making indirect transmission from objects contaminated with infected blood possible.

HDV is transmitted through percutaneous or mucosal contact with infectious blood as outlined above.

Incubation Period

Usually 45-180 days (average 60-90 days). The variation depends on the amount of virus in the inoculum, mode of transmission, and other host factors.

HDV is approximately 2-8 weeks

Period of Communicability

From several weeks before onset of symptoms until infection is resolved. The presence of HBsAg indicates that the person is infectious. Carriers (those with chronic infection) may transmit the virus at any time. All chronic carriers should be considered infectious; infectivity varies according to HBe and the presence of DNA.

HDV blood is potentially infectious during all phases of active HDV infection

Risk Factors

The following put an individual at increased risk:

- Sexual partners and household contacts of HBsAg-positive persons, including men who have sex with men (MSM)
- Sharing of contaminated needles and/or syringes and other drug injection or preparation equipment
- Use of non-sterile equipment for tattoo/piercing etc.
- Presence of other STI's or having a history of multiple sex partners over a six month period
- Hemodialysis patients
- Inmates of juvenile detention facilities, prisons, and jails
- Clients and staff of institutions for the developmentally disabled who are bitten by patients
- Occupational injury (eg. needlestick)
- Travelling Internationally to HBV endemic areas (greater than six months) and having direct contact with the local population
- Diabetics who require glucose monitoring or other chronic conditions requiring frequent injections

HDV risk factors include person susceptible or infected with HBV, injection drug users, hemophiliacs sexually active adults, MSM, and those who come in close contact with blood or blood products.

Surveillance Case Definition

Acute Confirmed case of hepatitis B

- Hepatitis B surface antigen (HBsAg) and immunoglobulin M antibody to hepatitis B core antigen (anti-HBcIgM) positive in the context of a compatible clinical history or probable exposure

OR

- Clearance of HBsAg in a person who was documented to be HBsAg positive within the last six months in the context of a compatible clinical history or probable exposure

Probable case of hepatitis B

Acute clinical illness in a person who is epidemiologically linked to a confirmed case

Chronic carrier confirmed case of hepatitis B

- HBsAg positive for more than 6 months

OR

- Detection of HBsAg in the documented absence of anti-HBc-IgM

OR

- Detection of HBV DNA for more than 6 months

Unspecified confirmed case of hepatitis B

- Does not fit the criteria for either acute or chronic case above AND
- HBsAg positive

OR

- Detection of HBV DNA

Confirmed case of Hepatitis D

- Acute clinical illness with coexistent hepatitis B infection (HBsAg+ or IgM anti-HBc+) and laboratory confirmation of infection:
- Detection of total antibody to hepatitis D (anti-HDV) by EIA

OR

- Detection of IgM antibody to HDV (anti-HDV IgM)

OR

- Detection of HDV nucleic acid (e.g., PCR) in a blood sample or liver biopsy.

Diagnosis and Laboratory Guidelines

Serology remains the most common testing method used for diagnosis of hepatitis B and for distinguishing between acute and chronic cases. The serological tests include detection of hepatitis B viral antigens (surface antigen, e antigen) and antibodies (surface, core and e).

Molecular methods allow for detection and quantification of viral DNA in a plasma or serum sample. It is not used for diagnosis as much as to establish viral load and infectiveness. Molecular genotyping is also available, but it is used mainly for epidemiological purposes.

The following table includes the serologic markers for hepatitis B according to the stages of the disease. These tests can be processed in New Brunswick regional laboratories.

Serologic markers for hepatitis B						
Stage	HBsAg	HBeAg	Anti-HBc IgM	Anti-HBc IgG/total	HB viral DNA	Anti HBs
Acute (early)	+	+	+	+	+	–
Acute (resolving)	+	–	+	+	–	–
Chronic	+	+/–	–	+	+/–	–

Resolved	–	–	–	+	–	+/–
Vaccinated	–	–	–	–	–	+

In some chronic cases the anti-HBs may coexist with the HBsAg. This can be attributed to a mutation in the surface protein gene. These clients should be considered infectious until proven otherwise by a specialist.

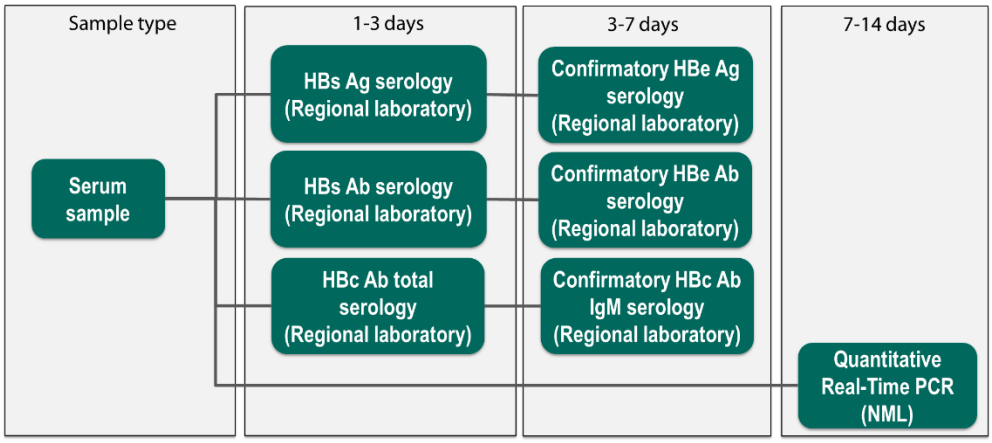
Some individuals will have low titers of Anti-HBc IgM for up to 2 years after initial infection. The titer may rise during flare-ups.

Hepatitis serologic testing may be done to diagnose acute or chronic infection, confirm immunity through natural infection or vaccination, as well as identifying non-immune individuals. Contact your regional laboratory for information on specimen collection and testing timelines.

Hepatitis D diagnosis is done through serology or PCR. The serological test currently in use for Hepatitis D does not differentiate for chronic or acute infection. Hepatitis D detection tests are **not available in New Brunswick** and all testing is performed at the National Microbiology Laboratory in Winnipeg.

Laboratory Testing

An overview of testing timelines for hepatitis B samples after the sample has been received by the laboratory. Turnaround times are averages and may change depending on the urgency of the situation. All hepatitis D samples are sent to the National Microbiology Laboratory and the turnaround time is between 10-21 days.



Reporting

Per Policy 2.2 Disease and Event Notification to OCMOH and Disease and Event Reporting section.

- Enhanced Surveillance. For all confirmed cases an enhanced surveillance form should be completed and information sent to OCMOH on a monthly basis (STBBI Database)
- Routine Surveillance (RDSS) for all confirmed cases of acute or chronic/unspecified Hepatitis B

- Routine Surveillance (RDSS) for all confirmed cases of Hepatitis D (Under Non HAHBHC).

For laboratory confirmed cases who have a history of donation or transfusion (blood/blood products), a *Disclosure of Information to Canadian Blood Services Transfusion Transmissible Infections (TTI)* form must be completed and sent to the CD Specialist at Canadian Blood Services upon receipt of information.

Case Management

For acute and chronic infections case management should be initiated according to STBBI Introduction of the New Brunswick Reportable Diseases and Events Guide, the Canadian Guidelines for Sexually Transmitted Infection or as directed by the Regional Medical Officer of Health (RMOH).

Education

Public health professionals play an important role in educating clients about HBV and HDV. In order to protect others from infection, as well as protecting the case from other co-infections ie: Hep D, the case or relevant caregiver should be informed about nature of the infection, prevention measures and provided the following recommendations;

- Instruct not to share personal items (items that might have traces of blood) such as toothbrushes, razors, dental floss, nail clippers, sex toys etc., and drug injection or preparation equipment such as needles, snorting equipment, straws pipes etc.
- Instruct not to donate blood, tissues, organs or semen
- Instruction on proper disposal of articles containing blood (i.e. tampons, bandages etc). Dispose in a separate sealed plastic bag before disposing in household garbage
- Provide information on how to properly clean blood spills
- Advise patient on the need to inform personal service provider (eg., tattoo artist, esthetician etc) of their infection so proper precautions can take place.
- Advise individuals to inform their sexual partners of their HBV infection and practice safe sex
- Advised to limit or avoid alcohol consumption as alcohol is a risk factor for more rapid progression to cirrhosis
- Review medications and consult with health care professional as needed.

Investigation

- Investigate newly detected cases, as well as previously detected out of Province cases.
- Contact the case as soon as possible after confirming the diagnosis and treatment with the health care provider. Arrange a face to face meeting if possible.
- Discuss the importance of notifying contacts. Include contacts within the period of infectivity (previous six months), who share drug-using equipment and sexual contacts. Confirm who will assume responsibility of contact notification.
- Ensure the case has access to a clinician for medical follow-up.
- Assess for the need for psychological support and or counselling.
- Discuss and encourage testing for other STBBI's.
- In the case of an acute infection the individual should be advised of the need for follow- up testing in six months to determine if the HBsAG individual has become a carrier
- Individuals identified as chronic carriers should have access to a specialist for follow up

Exclusion/ Social Distancing

Individuals infected by HBV should not be routinely excluded from work, school, play, child care, or other settings on the basis of their HBV infection status. In the event that an individuals work involves high risk of transmission precautions should be taken to prevent exposure of others to blood/body fluids.

The MOH should be consulted if a case is in an occupation or activity that poses or may pose a risk to others (i.e. sex trade, healthcare worker).

Treatment

There is no specific therapy for acute HBV infection. Treatment is supportive and generally does warrant referral to a hepatitis specialist. Any patient known to have chronic hepatitis B should be referred to a specialist for further management.

Immunization

Hepatitis B vaccine is not provided to acute cases.

Individuals infected with chronic hepatitis B are eligible to receive publicly funded hepatitis A, and Pneumococcal P-23 vaccine. Refer to the New Brunswick Immunization Program Guide for more information.

Contact Management

Contact management, treatment and follow-up should be initiated according to STBBI Introduction of the New Brunswick Reportable Diseases and Events Guide, the Canadian Guidelines for Sexually Transmitted Infection or as directed by the Regional Medical Officer of Health (RMOH).

Education

Contacts should be informed about nature of the infection, their potential exposure, and recommendations for testing as per the previous Diagnosis and Laboratory Guidelines section. Explain mother to child transmission and the importance of identifying any contacts that may be pregnant. Children have a great risk of becoming chronic carriers

Provide education and encouragement for the consistent use of reduced risk reduction such as sexual abstinence, reduced number of sexual partners, proper use of barriers methods and risk reduction with IDU.

Investigation

- Tracing of contacts should be based on the estimated duration of infection, all partners in the six months prior to the positive testing should be identified.
- All contacts should be encouraged to be tested for HBV (HBsAg, Anti-HBc IgM and Anti-HBc IgG/total) and given specific details on where to be tested, and how it will be reported if positive.
- Inform contacts of importance of testing for other STIs

- Public Health-Initiated internet or text messaging notification may be used to obtain the traditional contact information, to notify the partner, and to offer testing and/or treatment as per protocol. Patient-Initiated internet or text messaging notification can be used to inform partners of their exposure with a recommendation for follow-up with public health. These methods may be particularly helpful in reaching anonymous partners.

Exclusion/ Social Distancing

Contacts should abstain from unprotected sexual activities and take actions to prevent exposure of others to blood and body fluids.

Contact should abstain from blood, tissue and organ donations until negative results are obtained.

Contacts should take standard blood and body fluid precautions until negative results are obtained.

Prophylaxis

Immunoprophylaxis:

Pre exposure

Household and/or contacts of persons with acute and chronic HBV infection are eligible to receive publicly funded hepatitis B vaccine.

Refer to New Brunswick Immunization Program Guide and Canadian immunization Guide and the latest version of the Canadian Guidelines on Sexually Transmitted Infection for more information.

Post-exposure

Administer post exposure prophylaxis (HBV vaccine and/or immunoglobulin) to susceptible individuals in consultation with the regional medical officer of health to the following individuals

- Infants born to mothers with acute or chronic HBV infection
- Percutaneous or mucosal exposure to blood or bodily fluids potentially containing HBV
- Sexual or household contacts of an acute or chronic carrier

Refer to the New Brunswick Immunization Program Guide and Canadian immunization Guide for more information for eligibility criteria, dosing and timing.

Outbreak Management

Activate the local outbreak plan when an outbreak is declared.

Management of special situations

For further information on the management of hepatitis B infection, refer to the Management of Viral Hepatitis: A Canadian Consensus Conference 2003/2004, Canadian Consensus Guidelines for the Management of Hepatitis B and Hepatitis C (2007) and Canadian Guidelines on Sexually Transmitted Infections.

Pregnant women

Pregnant women with no history of Hepatitis B immunization should be screened at their initial prenatal visit for HBsAg. A pregnant woman who has no markers of acute or chronic HBV infection but who is at high risk of acquiring HBV should be offered vaccine at the first opportunity and tested for antibody response. Pregnancy is not a contraindication for immunization. If testing has not been done during pregnancy, it should be done at the time of delivery.

Adoption from area/ situations with a high prevalence of Hepatitis B

Children adopted from areas or family situations in which there is a high prevalence of HBV infection should be screened for HBsAg and if they are positive, household contacts should be immunized before adoption or as soon as they are aware of the immune status of the child.

Healthcare workers

In any situation in which a worker, who is HBV positive, is uncertain about the potential transmission risks of HBV or proper practices to minimize the risk to clients, he or she should consult with an employee/occupational health professional or an infection prevention and control professional.