HEPATITIS B INFORMATION SHEET

For staff/student health care workers who have not completed hepatitis B vaccination and who do not have adequate post-vaccination hepatitis B antibodies detected (vaccine non-responders)

Hepatitis B is a blood borne virus transmitted by the body fluids, such as blood, semen, vaginal secretions and any other body fluid containing blood, from a person infected with hepatitis B. The infective body fluid must enter the blood stream, for example from a sharps injury or exposure to mucous membranes such as the lining of the mouth.

Epidemiology
Hepatitis B is the most readily transmitted of the blood borne viruses, and since the early 1970s when testing for hepatitis B commenced, there have been many published reports of clusters of patient/clients infected with hepatitis B by hepatitis B infected Health Care Workers (HCWs). There have also been multiple reports of transmission of hepatitis B from infectious patient/clients to non-immune HCWs. Transmission of hepatitis B has been shown to occur in the healthcare setting primarily via injuries sustained during the performance of exposure prone procedures (EPPs) which enable either patient/client exposure to the blood of an infectious HCW or HCW exposure to the blood of an infectious patient/client. Transmission has also been documented in association with the performance of invasive procedures, other than those which are exposure prone, and sharps injury; and despite modification of EPP practice to minimize the risk of injury and subsequent exposure (Health and Welfare Canada, 1992; Heptonstall J, 1991, Lettau A L et al, 1986).

In Australia, between January 2001 and December 2002, there were 837 acute hepatitis B notifications with more than 60% of these occurring in the 25-59 year age group (Brotherton et al, 2004, s19-20). Acute hepatitis B infection leads to chronic infection and carrier status in some people and prevalence rates of hepatitis B infection in Australia range from 0.1 to 0.2% in the Caucasian population and to greater than 10% in some Aboriginal populations. First generation immigrants usually retain the carrier rate of their country of origin (NHMRC, 2003, p167-8).

The impact of Hepatitis B on adults
Acute infection with hepatitis B, may produce a range of conditions from subclinical infection to acute hepatitis with jaundice and rarely fulminant hepatitis. The risk of an acute infection becoming chronic varies inversely with age: chronic hepatitis B infection occurs in about 90% of infants infected at birth and about 1-10% of people infected as adults. Of those chronically infected with hepatitis B, 15-40% develop cirrhosis of the liver and/or hepatocellular carcinoma. (Brotherton et al, 2004, s18).

Exposure Prone Procedures (EPPs)
EPPs are procedures characterised by the potential for direct contact between the skin of the HCW and sharp surgical instruments, needles or sharp tissues (spicules of bone or teeth) in body cavities or in poorly visualised or confined body sites (including the mouth). HCWs must not perform EPPs if they have not completed a course of hepatitis B vaccination, are HBeAg and/or hepatitis B DNA positive, hepatitis C (HCV) PCR positive or human immunodeficiency virus (HIV) antibody positive. HCWs who perform EPPs as part of their employment have a responsibility to have regular screening at least annually and after any body fluid exposure for hepatitis B if post vaccination antiHBs ≤10 mlu/mL, HCV and HIV.

Hepatitis B vaccination
Hepatitis B is currently the only blood borne virus for which a vaccine is available. Successful hepatitis B vaccination prevents a person from acquiring hepatitis B, thus eliminating the possibility that they may become infected and transmit the infection to others.

A course of hepatitis B vaccine for adults consists of three 1 ml doses with a minimum of one month between the first two doses and a minimum of two months between the second and third doses. Ideally
there is five months between doses two and three. This induces protective levels of antibody against hepatitis B virus in over 90% of young adults however a small number of people may require a further vaccines to produce an adequate antibody response. A small percentage of people do not get a detectable antibody response (vaccine non-responders).

**Post vaccination blood testing**

Blood testing for anti-HBs should be carried out approximately 4 weeks after the third injection to provide evidence of protection which is especially important in the event of a body substance exposure and to identify if further vaccines and blood tests may be indicated. In conjunction with a completed vaccination course a positive antibody result (anti-HBs ≥ 10 mIU/mL) indicates long term protection to hepatitis B.

If adequate anti-HBs levels (≥10mIU/mL) are not reached following the third dose of vaccine, the possibility of hepatitis B infection should be investigated by testing for HBsAg. Those who are HBsAg negative and do not respond should be offered further doses of vaccine. These can be given as either a fourth double dose or a further 3 doses at monthly intervals, with further testing 4 weeks later.

**Post exposure prophylaxis for hepatitis B in the workplace**

Hepatitis B is one of several viruses which may be acquired by significant exposure to blood or other body substances. Rapid assessment of the exposure incident is essential to assess if there is a risk of acquiring hepatitis B.

Where it is assessed there is a risk of acquiring hepatitis B from an exposure to a body fluid, persons who have not completed a hepatitis B vaccination course and have adequate post vaccination anti-HBs levels (≥10mIU/mL) are assumed to be non-immune and require administration of hepatitis B immunoglobulin (HBIG) as soon as possible. Administration of HBIG should not be delayed beyond 72 hours as the effectiveness of HBIG falls rapidly over time and HBIG given more than three days after exposure may be of little value. Hepatitis B vaccine should be administered at the same time in the other deltoid muscle.

Hepatitis B immunoglobulin (HBIG) is prepared from plasma donated through routine blood bank collection. Samples are selected on the basis that they contain high levels of antibody to hepatitis B surface antigen (HBsAg). Blood used for HBIG is screened to exclude hepatitis B, hepatitis C virus, human immunodeficiency virus, human T-cell lymphotropic virus and syphilis. It then undergoes processing and a viral inactivation process.

**References**


Heptonstall J. Outbreaks of hepatitis B virus infection associated with infected surgical staff. Commun Dis Rep (UK) 1991; 1R81-5
