

BI0017 / **BIOLOGICAL** / Infectious Diseases (Human and Animal)

Blood Borne Viruses

Definition

Blood-borne viruses are viruses transmitted by direct contact with infected blood or other body fluids (WHO, 2012).

Reference

WHO, 2012. Disease information. World Health Organization (WHO). www.who.int/travel-advice/disease-information Accessed 19 September 2020.

Annotations

Synonyms

Not identified.

Additional scientific description

Blood-borne viruses are viruses that some people carry in their blood and which can be spread from one person to another. Those infected with a blood-borne virus may show little or no symptoms of serious disease, while other infected people may be severely ill. An infected person can transmit (spread) blood-borne viruses from one person to another by various routes and over a prolonged time period (HSE, no date a). The most prevalent blood-borne viruses are: human immunodeficiency virus (HIV) – a virus which causes acquired immunodeficiency syndrome (AIDS), a disease affecting the body's immune system; and, hepatitis B (HBV) and hepatitis C (HCV) – blood-borne viruses causing hepatitis, a disease affecting the liver (NHS Ayrshire and Arran, no date).

Exposure to these viruses can also occur through exposure to infected vaginal secretions, semen, and breast milk (HSE, no date a).

Blood-borne viruses are transmitted by blood, or other body fluids containing a virus. This happens when the blood or fluids enter the body of a susceptible person. The rate of viral transmission varies depending on how the person has been exposed to the virus (the route of transmission), the type of virus, how much of the virus the carrier has in their body and the immune status of the exposed person (HSE, no date b). The more common routes of transmission include: sexual intercourse (common for HBV, HIV; inefficient for HCV); sharing injecting equipment; skin puncture by blood-contaminated sharp objects (e.g., needles, instruments or glass); and childbirth (i.e., the mother infects the child either before or during birth, or through breast-feeding) (All Answers Ltd, 2018).

Less common routes of transmission include: contamination of open wounds (e.g., blood injuries during sporting activities); contamination of skin lesions (e.g., eczema); splashing of the mucous membranes of the eye, nose or mouth; and human bites when blood is drawn (this may be more of a problem in certain occupations, such as the prison and police service, where frontline workers may be exposed to violent behaviour) (HSE, no date b).

There is also a risk of acquiring a blood-borne virus infection via blood transfusion. For example, in the UK, all blood donations are screened for HBV, HCV and HIV, meaning the risk is remote (HSE, no date b).

Health care workers are at risk of infection with blood-borne pathogens because of occupational exposure to blood and body fluids. Most exposures are caused by 'sharps' – contaminated sharp objects, such as syringe needles, scalpels and broken glass. The three infections most commonly transmitted to health care workers are HBV, HCV and HIV (WHO, 2002).

Among the 35 million health care workers worldwide, about three million receive percutaneous exposures to blood-borne pathogens each year; 2 million of those to HBV, 0.9 million to HCV and 170,000 to HIV. These injuries may result in 15,000 HCV, 70,000 HBV and 500 HIV infections. More than 90% of these infections occur in developing countries. Worldwide, about 40% of HBV and HCV infections and 2.5% of HIV infections in health care workers are attributable to occupational sharps exposures (WHO, 2002). However, other blood-borne pathogens still pose a risk: for example, in the 2013–2016 Ebola virus disease outbreak, over 890 health-care workers were infected, with a case fatality rate of 57% (Auta et al., 2017).

These infections are for the major part preventable, as shown by the low rates achieved in certain countries that have engaged in serious prevention efforts, including training of health care workers, HBV immunisation, post-exposure prophylaxis and improved waste management. In addition to the disease burden caused to health care workers, the functioning of the health care system may be reduced because of impaired working capacity, especially in developing countries where the proportion of health care workers in the population is already small compared with that in developed countries (WHO, 2005).

Metrics and numeric limits

Not applicable.

Key relevant UN convention/multilateral treaty

International Health Regulations (2005), 3rd ed. (WHO, 2016).

Examples of drivers, outcomes and risk management

For health care and other emergency workers standard precautions are meant to reduce the risk of transmission of blood-borne and other pathogens from both recognised and unrecognised sources (WHO, 2007). Standard precautions are the basic level of infection control precautions which are to be used, as a minimum, in the care of all patients.

Hand hygiene is a major component of standard precautions and one of the most effective methods to prevent transmission of pathogens associated with health care. In addition to hand hygiene, the use of personal protective equipment should be guided by risk assessment and the extent of contact anticipated with blood and body fluids, or pathogens (WHO, 2007).

In addition to practices carried out by health workers when providing care, all individuals (including patients and visitors) should comply with infection control practices in health-care settings. The control of spread of pathogens from the source is key to avoid transmission. Among source control measures, respiratory hygiene/cough etiquette is now considered as part of standard precautions (WHO, 2007).

Worldwide escalation of the use of standard precautions would reduce unnecessary risks associated with health care. Promotion of an institutional safety climate helps to improve conformity with recommended measures and thus subsequent risk reduction. Provision of adequate staff and supplies, together with leadership and education of health workers, patients, and visitors, is critical for an enhanced safety climate in health-care settings (WHO, 2007).

References

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Coordinating agency or organisation

World Health Organization.