

# Hendra Virus Disease (HeV)

Hendra virus (HeV) is a member of the family Paramyxoviridae and one of two virus species in the genus Henipavirus (the other being Nipah virus). HeV was first isolated in 1994 from specimens obtained during an outbreak of respiratory and neurologic disease in horses and humans in Hendra, a suburb of Brisbane, Australia.

The natural reservoir for Hendra virus has since been identified as the flying fox (bats of the genus Pteropus).

Since 1994 and as of 2013, Hendra virus infections in humans remain rare; only seven cases have been reported.

## Transmission

Transmission of Hendra virus to humans can occur after exposure to body fluids and tissues or excretions of horses infected with Hendra virus.

Horses may be infected after exposure to virus in the urine of infected flying foxes.

To date, no human-to-human transmission has been documented.

## Signs and Symptoms

After an incubation of 9-16 days, infection with Hendra virus can lead to respiratory illness with severe flu-like signs and symptoms. In some cases, illness may progress to encephalitis.

Although infection with Hendra virus is rare, the case fatality is high: 4/7 (57%).

## Risk of Exposure

Australia's "Flying fox" bats (genus Pteropus) are the natural reservoir of Hendra virus. Serologic evidence for HeV infection have been found in all four species of Australian flying foxes, but spillover of the virus in horses is limited to coastal and forested regions in Australia (Queensland and New South Wales states) (see Henipavirus Distribution Map).

People at highest risk are those living within the distribution of the flying foxes and with occupational or recreational exposure to horses that have had potential contact with flying foxes in Australia.

## Diagnosis

Laboratory tests that are used to diagnose Hendra virus (HV) and Nipah virus (NV) include detection of antibody by ELISA (IgG and IgM), real time polymerase chain reaction (RT-PCR), and virus isolation attempts. In most countries, handling Hendra virus needs to be done in high containment laboratories. Laboratory diagnosis of a patient with a clinical history of HV or NV can be made during the acute and convalescent phase of the disease by using a combination of tests including detection of antibody in the serum or the cerebrospinal fluid (CSF), viral RNA detection (RT-PCR) in the serum, CSF, or throat swabs, and virus isolation from the CSF or throat swabs.

## Treatment

The drug ribavirin has been shown to be effective against the viruses in vitro, but the clinical usefulness of this drug is uncertain.

A post-exposure therapy with a Nipah/Hendra neutralizing antibody, efficacious in animal models is in human preclinical development stages in Australia.

## Prevention

The occurrence of the disease in humans has been associated only with infection of an intermediate species such as horses. Early recognition of the disease in the intermediate animal host is probably the most crucial means of limiting future human cases.

Hendra virus infection can be prevented by avoiding horses that are ill or may be infected with HeV and using appropriate personal protective equipment when contact is necessary, as in veterinary procedures.

A commercial vaccine has been recently licensed in Australia for horses and could be beneficial for other animal species and eventually humans.

## References

Broder C. Henipavirus outbreaks to antivirals: the current status of potential therapeutics. *Current Opinion in Virology* 2012;2:176-187.

Field H, de Jong C, Melville D, et al. Hendra virus infection dynamics in Australian fruit bats. *PLoSOne*. 2011;6(12):e28678 (free access).

Field H, Crameri G, Kung N, et al. Ecological aspects of Hendra virus. *Current Topics in Microbiology & Immunology*. 2012;359(11-23).

Murray K, Selleck P, Hooper P, et al. A morbillivirus that caused fatal disease in horses and humans. *Science*. 1995;268:94-97.

O'Sullivan JD, Allworth AM, Paterson DL, et al. Fatal encephalitis due to novel paramyxovirus transmitted from horses. *Lancet*. 1997;349(9045):93-95.

Queensland Government, Department of Agriculture, Fisheries and Forestry

New South Wales Department of Primary Industries, Agriculture