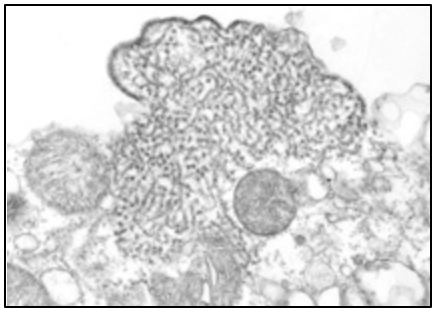
Hendra Virus Disease & Nipah Virus Encephalitis

Fact Sheet

What are Hendra and Nipah viruses?

Hendra virus (formerly called equine morbillivirus) is a member of the family Paramyxoviridae. The virus 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.

Nipah virus, also a member of the family Paramyxoviridae, is related but not identical to Hendra virus. Nipah virus was initially isolated in 1999 upon examining samples from an outbreak of encephalitis and respiratory illness among adult men in Malaysia and Singapore.



Nipah virus electron micrograph Image courtesy of C.S. Goldsmith and P.E. Rollin (CDC), and K.B. Chua (Malaysia).

Where are Hendra and Nipah viruses found?

The natural reservoir for Hendra virus is thought to be flying foxes (bats of the genus *Pteropus*) found in Australia. The natural reservoir for Nipah virus is still under investigation, but preliminary data suggest that bats of the genus *Pteropus* are also the reservoirs for Nipah virus in Malaysia.

Where are the diseases found?

Hendra virus caused disease in horses in Australia, and the human infections there were due to direct exposure to tissues and secretions from infected horses. Nipah virus caused a relatively mild disease in pigs in Malaysia and Singapore. Nipah virus was transmitted to humans, cats, and dogs through close contact with infected pigs.

How are Hendra and Nipah viruses transmitted to humans?

In Australia, humans became ill after exposure to body fluids and excretions of horses infected with Hendra virus. In Malaysia and Singapore, humans were infected with Nipah virus through close contact with infected pigs.

What are the signs and symptoms of Hendra virus disease and Nipah virus encephalitis?

Only three human cases of Hendra virus disease have been recognized. Two of the three individuals known to be infected had a respiratory illness with severe flu-like signs and symptoms. Infection with Nipah virus was associated with an encephalitis (inflammation of the brain) characterized by fever and drowsiness and more serious central nervous system disease, such as coma, seizures, and inability to maintain breathing.
Illness with Nipah virus begins with 3-14 days of fever and headache. This is followed by drowsiness and disorientation characterized by mental confusion. These signs and symptoms can progress to coma within 24-48 hours. Some patients have had a respiratory illness during the early part of their infections.

Are there any complications after recovery?
One of the three Hendra virus infections was marked by a delayed onset of progressive encephalitis. Serious nervous disease with Nipah virus encephalitis has been marked by some sequelae, such as persistent convulsions and personality changes.

Are the diseases ever fatal?
Two of the three human patients infected with Hendra virus died. During the Nipah virus disease outbreak in 1998-99, about 40% of the patients with serious nervous disease who entered hospitals died from the illness.

How are Hendra virus disease and Nipah virus encephalitis treated?
The drug ribavirin has been shown to be effective against the viruses in vitro. However, controlled drug investigations have not been performed and the clinical usefulness of these drugs is uncertain.

Who is at risk for disease from Hendra and Nipah viruses?
People who have contact with body fluids or excretions of horses infected with Hendra virus are at risk for Hendra virus disease. Nipah virus infection is associated with close contact with Nipah virus-infected pigs. Neither disease has spread from human to human.

How are infections with Hendra and Nipah virus prevented?
These diseases can be prevented by avoiding animals that are known to be infected and using appropriate personal protective equipment devices when it is necessary to come into contact with potentially infected animals.

What needs to be done to address the threat of Hendra and Nipah viruses?
The distribution of these agents in their natural reservoirs will eventually define the geographic range of the threat the viruses pose. However, these viruses are recent discoveries, and much work remains to be done on their geographic distribution and the reservoir species. The occurrence of the disease in humans has been associated only with infection of an intermediate species such as horses with Hendra and swine with Nipah virus. Early recognition of the disease in the intermediate animal host is probably the most crucial means of limiting future human cases.

Suggested Reading

- K Murray, P Selleck, P Hooper, et al. A morbillivirus that caused fatal disease in horses and humans. Science 1995, 268:94-7.
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- Paton NI, Leo YS, Zaki SR, et al. Outbreak of Nipah-virus infection among abattoir workers in Singapore. Lancet 1999; 3541253-6.
- Lee KE, Umapathi T, Tan CB, et al. The neurological manifestations of Nipah virus encephalitis, a novel paramyxovirus. Ann Neurol 1999; 46428-32.
- CDC, Outbreak of Hendra-like virus—Malaysia and Singapore, 1998-1999. MMWR. Apr 9, 1999; vol 48, no 3, 265-269.
- CDC, Update: Outbreak of Nipah virus-- Malaysia and Singapore, 1999. MMWR, Apr 30, 1999; vol 48, no 16, 335-337.