FRIEDRICH-LOEFFLER-INSTITUT
FLI
Bundesforschungsinstitut für Tiergesundheit
Federal Research Institute for Animal Health

Nipah Virus

Susceptible species

Nipah Virus (NiV) can cause infection, often severe, in humans and pigs. More rarely, infection has also been detected in dogs, cats, ruminants, or horses. Experimental infection of guinea pigs and hamsters has been successful. Reservoir hosts are fruit-eating flying foxes of the genus Pteropus, which can transmit the virus to other animals and humans.

Distribution area

The first NiV outbreak was described in 1998/99 in pig holdings in Malaysia and Singapore. The pigs developed febrile respiratory disease associated with labored breathing and a characteristic barking cough. Some animals showed central nervous disorders. Transmission from flying foxes occurred through excreta containing infected fruit which were ingested by pigs. Transmission from diseased pigs to humans (285 infections, 105 of them fatal) occurred through direct contact with infected animals and their secretions (saliva, urine, blood). Since 2001, human NiV infections have been observed every year in Bangladesh and Northern India. In these cases, the virus is transmitted directly from flying foxes to humans. The pig as intermediate host does not play a role in these outbreaks. Human-to-human transmission has also been described in these more recent outbreaks.

Causative agent

NiV belongs to the genus Henipavirus of the family Paramyxoviridae and is closely related with Hendra Virus. Based on the regulation on biological substances HeV is classified into risk group 4.

Transmission

Infected animals and patients excrete the virus with respiratory secretions, saliva and urine. Contact with respiratory secretions is considered to be the main transmission route in nosocomial infections.

Clinical picture

Infected pigs develop fever and respiratory symptoms with a characteristic cough. Central nervous symptoms are rare.

During the outbreak in Malaysia in 1998/99 the mortality rate of hospitalized patients was 37 %. In NiV outbreaks in Bangladesh and Northern India, where a different virus strain circulates, the mortality rate is > 70 % and thus considerably higher. However, the lower mortality rate in Malaysian patients is also due to the better quality of intensive care. The incubation period is between 5 and 18 days. After infection, initially, non-specific influenza-like symptoms such as fever and headache, sore throat, vomiting, muscle pain, and/or respiratory symptoms occur. After 3 to 14 days, dizziness, impaired consciousness or even coma, focal neurological symptoms such as seizures, autonomic dysfunction, respiratory

dysregulation, may occur which may be signs of encephalitis. Encephalitis may also occur months or years after an initially survived NiV infection.

Diagnostics

Virus detection is performed by RT-PCR during the acute phase of disease in blood or other clinical material, particularly serum, liquor, pharyngeal swabs, respiratory secretions. Usually, virus cultivation in Vero cells is successful. Serological detection of specific antibodies is possible starting from day 7 to 9 of disease. Test materials are highly contagious. In general, laboratory diagnostics of animal samples should be done at the FLI (National Reference Laboratory for Henipaviruses of Animals) and of human samples at the Bernhard Nocht Institute for Tropical Medicine (National Reference Laboratory).

Similar clinical pictures

Similar symptoms may occur in viral infections associated with pneumonia and/or encephalitis.

Control

Currently, there is no licensed vaccine or therapy to protect potentially exposed or infected humans or animals. Patients must be isolated as soon as NiV infection is suspected. After confirmation of NiV infection, treatment should take place in one of the specialized treatment centers for highly contagious diseases. Supportive intensive care measures and symptomatic treatment of pneumonia and if necessary encephalitis, stabilization of blood circulation, if necessary shock treatment are indicated. Many patients need assisted mechanical respiration.

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