

DISEASE CONDITION: NIPAH VIRUS INFECTION

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ABSTRACT

Nipah virus infection (NiV) is a viral infection caused by the Nipah virus. According to the World Health Organisation (WHO), Nipah virus is one of the “newly emerging zoonosis” (a disease that can spread from animals to humans) that can affect both humans and animals. Transmission of Nipah virus to humans may occur when one comes in direct contact with infected bats, infected pigs or infected people. The risk of exposure is high for hospital workers and caretakers of those infected with the virus. In Malaysia and Singapore, Nipah virus infection occurred in those with close contact to infected pigs. In Bangladesh and India, the disease has been linked to consumption of raw date palm sap (toddy) and contact with bat.

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DEFINITION

Nipah virus infection (NiV) is a viral infection caused by the Nipah virus. Symptoms from infection vary from none to fever, cough, headache, shortness of breath, and confusion. This may worsen into a coma over a day or two (NiV) is a member of the family Paramyxoviridae under genus Henipavirus. NiV was initially isolated and identified in 1999 during an outbreak of encephalitis and respiratory illness among pig farmers and people with close contact with pigs in Malaysia and Singapore.

WHAT IS NIPAH VIRUS

According to the World Health Organisation (WHO), Nipah virus is one of the “newly emerging zoonosis” (a disease that can spread from animals to humans) that can affect both humans and animals. This is a highly contagious and deadly virus for which there is currently no vaccine and treatment for humans, as well as animals. Apart from animal to human and human to animal transmission of this virus, human to human transmission of this virus also occurs.

SIGNS AND SYMPTOMS OF NIPAH VIRUS INFECTION

- Once a person is infected with Nipah virus, it usually takes five to 14 days for the symptoms of an infection to appear. The symptoms of Nipah virus infection include:
- Acute respiratory infection, which can be mild to severe and causing interference in breathing
- Fever
- Muscle pain (myalgia)
- Headaches
- A sore throat
- Nausea
- Vomiting
- Dizziness
- Drowsiness
- Mental confusion and disorientation
- Atypical pneumonia
- Brain swelling or fatal encephalitis
- Gradual progression to coma within 24 to 48 hours.

People who survive the infection may suffer from long-term side effects such as convulsions and personality changes.

RISK FACTORS

Transmission of Nipah virus to humans may occur when one comes in direct contact with infected bats, infected pigs or infected people. The recent outbreak of Nipah virus in Kerala (May2018), occurred when people consumed fruits bit by infected fruit bats. When bats carrying the virus bite into fruits, the virus enters the fruits and then infects the humans who consume it. Bats shed the virus in their excrement and secretions which can infect humans, as well as animals such as pigs, dogs, cows, etc., who come into contact with the droppings.

Fruit bats are the natural reservoirs of Nipah virus.

The risk of exposure is high for hospital workers and caretakers of those infected with the virus. In Malaysia and Singapore, Nipah virus infection occurred in those with close contact to infected pigs. In Bangladesh and India, the disease has been linked to consumption of raw date palm sap (toddy) and contact with bat.

DIAGNOSTIC TECHNIQUES

Nipah virus is diagnosed with a combination of tests such as:

- Throat and nasal swabs which are sent to the laboratory for testing

- Blood tests
- Virus isolation and detection
- Cerebrospinal Fluid analysis
- Urine test
- Laboratory diagnosis of Nipah virus infection is made using reverse transcriptase polymerase chain reaction (RT-PCR) from throat swabs, cerebro-spinal fluid, urine and blood analysis during acute and convalescent stages of the disease. IgG and IgM antibody detection can be done after recovery to confirm Nipah virus infection. Immunohistochemistry (IHC) on tissues collected during autopsy also confirms the disease. Viral RNA can be isolated from the saliva of infected persons.

PREVENTION

1. Prevention of Nipah virus infection is important since there is no effective treatment for the disease.
2. The infection can be prevented by avoiding exposure to bats in endemic areas and sick pigs.
3. Drinking of raw palm sap (palm toddy) contaminated by bat excreta, eating of fruits partially consumed by bats and using water from wells infested by bats should be avoided.
4. Bats are known to drink toddy that is collected in open containers, and occasionally urinate in it, which makes it contaminated with the virus.
5. Surveillance and awareness are important for preventing future outbreaks.
6. The association of this disease within reproductive cycle of bats is not well studied.
7. Standard infection control practices should be enforced to prevent nosocomial infections.

TREATMENT

Currently there is no effective treatment for Nipah virus infection. The treatment is limited to supportive care. It is important to practice standard infection control practices and proper barrier nursing techniques to avoid the spread of the infection from person to person. All suspected cases of Nipah virus infection should be isolated.

Ribavirin has been studied in a small number of people, however whether or not it is useful is unclear as of 2011. Passive immunisation using a human monoclonal antibody that targets the Nipah G glycoprotein has been evaluated in the ferret model as post-exposure prophylaxis. The anti-malarial drug chloroquine was shown to block the critical functions needed for maturation of Nipah virus, although no clinical benefit has yet been observed. m102.4, a human monoclonal antibody, has been used in people on a compassionate use basis in Australia and was in pre-clinical development in 2013.

COMPLICATIONS OF NIPAH VIRUS INFECTION

- Acute respiratory infections causing interference in breathing
- Seizures
- Encephalitis
- Mental confusion and disorientation
- Atypical pneumonia
- Brain swelling or fatal encephalitis
- Progression to a state of coma within 24 to 48 hours.

OUTBREAK

Nipah virus outbreaks have been reported in Malaysia, Singapore, Bangladesh and India. The highest mortality due to Nipah virus infection has occurred in Bangladesh. In Bangladesh, the outbreaks are typically seen in winter season. Nipah virus first appeared in Malaysia in 1998 in peninsular Malaysia in pigs and pig farmers. By mid-1999, more than

265 human cases of encephalitis, including 105 deaths, had been reported in Malaysia, and 11 cases of either encephalitis or respiratory illness with one fatality were reported in Singapore. In 2001, Nipah virus was reported from Meherpur District, Bangladesh and Siliguri in India. The outbreak again appeared in 2003, 2004 and 2005 in the districts of Naogaon, Manikganj, Rajbari, Faridpur and Tangail in Bangladesh where there also were outbreaks in the subsequent years.

In May 2018, an outbreak was reported in the Kozhikode district of Kerala, India. Seventeen deaths were recorded, including one of a healthcare worker. Those who have died were mainly from the districts of Kozhikode and Malappuram, including a 31-year-old nurse, who was treating patients infected with the virus. Two of the infected were completely cured. On June 10, 2018, the outbreak was officially declared to be over.

OTHER PRECAUTIONS

Since there is no vaccine or treatment currently for the Nipah virus, prevention is the key to stop the spread and to remain safe from this virus. Some important preventive measures include:

- Since fruits bats are the primary cause of Nipah virus infection, people who have domestic animals or have farm animals should prevent the animals from eating fruits contaminated by bats.
- Consumption of contaminated date palm sap including 'toddy' should also be avoided.
- Physical barriers can be erected in order to prevent fruit bats from accessing and contaminating palm sap.
- People raising pigs can consider putting wire screens to prevent contact between fruit bats and pigs if the pigs are raised in open pig sheds.
- Caretakers need to be able to swiftly recognise symptoms of infections in animals so that the infected among them can be isolated and an outbreak of infection prevented.
- Avoiding any form of direct contact with infected pigs, bats and humans are imperative to prevent infection. Health professionals such as nurses and doctors tending to infected patients must take precautionary measures, such as wearing gloves, using a gown, wearing a cap, wearing a mask and washing hands.
- Hospitals need to take care of necessary sanitation procedures while treating NiV patients to avoid transmission of the virus to other humans in those settings.
- Domestic animals may also become carriers of NiV as fruit bats often drop partially eaten fruits, which the domestic animals may consume.
- Try to keep the domestic animals indoors. Feed them yourself. And if you think that there's a chance they may be infected, take precautionary measures yourself by keeping your distance from them and get them treated.
- Do not climb trees which you suspect have bat secretions such as saliva or droppings.
- The primary carriers of NiV in humans are the respiratory secretions. If you are near an infected person, chances are you may get infected if you breathe in their out-breath.
- The risk is even higher if the patient starts showing respiratory symptoms, such as coughing and sneezing. Due to its highly contagious nature, refrain from sharing food, the bed, and the washroom with an infected patient.
- Do not stay close to a sneezing or coughing NiV patient and make sure not to come into contact with the saliva of an infected person.
- The urine of a NiV person has traces of the virus, therefore be cautious while sharing a washroom with an infected person.

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