

NIPAH VIRUS

Introduction

Nipah Virus (NiV) is a newly emerging **zoonosis**, closely related to the **Hendra virus**.

It can cause severe disease in both **animals** and **humans**.

Zoonoses are infectious diseases of animals (usually vertebrates) that can naturally be transmitted to humans.

Clinical features in human cases can range from asymptomatic to fatal encephalitis.

There is no specific treatment for Nipah virus infection, and so treatment is entirely supportive.

There is currently no vaccine available for humans or animals.

History

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.

Its name originated from **Sungai Nipah**, a village in the Malaysian Peninsula where pig farmers became ill with encephalitis.

Given the close relatedness of NiV to the Hendra virus, bat species were quickly singled out for investigation and **bats** of the genus **Pteropus** were subsequently identified as the reservoir for NiV.

Epidemiology

Nipah Virus was first identified during an outbreak in Kampung Sungai Nipah, Malaysia, in 1998.

All subsequent outbreaks have occurred in South Asia including:

- India
- Bangladesh
- Malaysia

- Singapore.

No human or animal cases of NiV infection have yet been detected in the state of Victoria.

Pathology

Organism

- Nipah virus is classified within the family **Paramyxoviridae** and the genus **Henipavirus**

Reservoir

Fruit bats from the **Pteropodidae** family, particularly the species belonging to the **Pteropus genus**, are the natural host for the Nipah Virus, although it does not cause illness in the bats.

Though Fruit bats are the natural host, pigs, horses, goats, sheep, cats and dogs can also become ill if infected and transmit the virus.

Nipah Virus outbreaks in domestic animals (i.e pigs, horses, goats, sheep, cats and dogs) were first reported during the initial Malaysian outbreak.

Nipah Virus is capable of causing severe disease in these domestic animals.

Transmission

During the initial outbreaks in Malaysia and Singapore, most human infections (predominantly of farmers and abattoir workers) resulted from **direct contact** with sick pigs or their contaminated tissues.

Transmission was thought to occur via:

- Respiratory droplets
- Contact with throat or nasal secretions of pigs
- Contact with the tissue of a sick animal in general

In the Bangladesh and India outbreaks, consumption of fruit or fruit products (raw date palm sap/juice) contaminated by **infected fruit bats** was the most likely source of infection.

During those outbreaks, NiV spread **directly from human to human** through **close contact** with **people's excretions, secretions** and **body fluids**.

In India, transmission from **human to human** was also reported in a healthcare setting.

From 2001 - 2008, approximately half of the reported cases of NiV infection in Bangladesh were due to human to human transmission.

Incubation Period

- Incubation period ranges from 4 - 18 days.

Period of communicability

- Currently unknown.

Susceptibility & resistance

- Susceptibility and resistance to Nipah virus infection is uncertain relapses of infection can occur.

Clinical Features

Clinical features in human cases can range from asymptomatic to fatal encephalitis.

A small number of people, usually those with initial mild or subclinical disease, can relapse or develop a delayed onset encephalitis.

Clinical features can include:

1. Non-specific constitutional symptoms:

- Fever
- Headaches
- Myalgias
- Anorexia, nausea, vomiting

2. Respiratory symptoms:

- Sore throat
- Cough
- SOB
- Pleuritic chest pain
- Respiratory involvement can be severe with an **ARDS** type picture.

3. Encephalitis:

- Altered conscious state
- Confusion
- Seizures in severe cases, progressing to coma within 24 - 48 hours

Prognosis:

- The case fatality rate for **encephalitis** is *high* and is estimated at around 40 - 75 %.
- About 80% of patients who *survive* encephalitis make a full recovery.
- Approximately 20% who survive encephalitis are left with residual neurological deficits, such as persistent convulsions and personality changes.

Investigations

The diagnosis can be made by:

1. Serology

The detection of specific neutralizing:

- IgM antibodies
- IgG antibodies

2. Polymerase chain reaction (PCR)

3. Virus isolation from infected tissues, by cell culture.

Symptomatic contacts should be considered for testing, in consultation with an infectious diseases physician.

In the state of Victoria, testing is available through the **CSIRO Australian Animal Health Laboratory** at Geelong.

Management

Prevention:

There is currently **no vaccine** available to prevent NiV infection in humans or in animals.

To reduce the risk of animal-to-human NiV transmission, gloves, gowns, protective eyewear and boots should be worn when handling sick animals or their tissues and during slaughtering and culling, along with good hand hygiene before leaving farms and abattoirs.

To reduce the risk of human-to-human transmission, unnecessary close physical contact with NiV-infected people should be avoided. If person-to person transmission is a possibility, isolation, along with standard, droplet and contact precautions, should be implemented.

Treatment:

There is currently no *specific* antiviral agents available to treat NiV infection.

An uncontrolled trial of the antiviral drug **ribavirin** however has suggested that it *may* reduce mortality in NiV encephalitis, but more study is required. Expert advice should be sought from an **infectious diseases physician**.

Treatment therefore is entirely **supportive**.

Notification:

Notification is not currently “officially” required in the state of Victoria; however, any new cases of this emerging virus **should** be reported to the department as a matter of urgency.

If a case is linked to exposure in Victoria (or elsewhere in Australia), the Health Department will work closely with relevant animal health authorities and scientists to identify and control possible sources of infection.

Measures could include:

- Testing possible animal sources (fruit bats) and affected animals for the presence of NiV or serological evidence of infection
- Using appropriate protective equipment and hygiene practices for animal handlers and investigators on implicated farms or properties
- Slaughtering infected animals and burying or incinerating the carcasses
- Restricting the movement of animals from infected farms or designated areas.

Disposition:

Expert advice should be sought from an infectious diseases physician for any suspected or actual case of Nipah virus infection.

References

1. Nipah Virus in the Bluebook Website, Accessed October 2017.
2. Nipah Virus in CDC Website, Accessed. October 2017.

Dr J. Hayes.
April 2018.