INTERNATIONAL SOCIETY FOR INFECTIOUS DISEASES

GUIDE TO INFECTION CONTROL IN THE HEALTHCARE SETTING

Nipah Virus

Authors
Ziad A Memish, MD, FRCPC, FRCPL, FRCPE, FACP, Shaheen Mehtar, MBBS. FRC Path, FCPath, MD, Gonzalo Bearman, MD, MPH, FACP, FSHEA, FIDSA

Chapter Editor
Gonzalo Bearman, MBBS. FRC Path, FCPath, MD

Topic Outline

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KEY ISSUES

Nipah virus is an emerging zoonotic virus of public health importance in the South East Asia region, capable of infecting humans and a wide range of domesticated animals (pigs, horses, goats, sheep, cats and dogs). In humans it tends to cause severe encephalitis, systemic vasculitis and pneumonia with very high mortality (ranges from 40-70%), while in domesticated animals it tends to cause no symptoms to mild disease with very low mortality (except in young piglets). Since its emergence and over the last 15 years, Nipah virus tended to cause spill-over sporadic zoonotic outbreaks in Malaysia, Bangladesh, Singapore and India killing more than 100 humans and leading to the culling of more than 1 million pigs.

KNOWN FACTS

- Nipah virus is an enveloped, non-segmented, negative-strand RNA virus very closely related to Hendra virus, the virus is named after the Malaysian village where it was first discovered.
- A member of the genus Henipavirus, a new class of virus in the Paramyxoviridae family.
- Like Hendra virus, the natural reservoir of Nipah virus was shown to be pteropid fruit bats, also known as flying foxes which has asymptomatic infection.
- The infectious virus has been isolated from the brain and CSF of infected humans, the urine of the natural reservoir (flying foxes) and the partially eaten fruits.
- Serological and virus detection studies have documented the presence of the virus in multiple flying fox species in many countries covering a wide geographic area (Malaysia, Bangladesh, India, Papua New Guinea, Cambodia, Indonesia, East Timor, Vietnam and Thailand). But no human infection has been documented to date in Cambodia, Vietnam or Africa.

- Nipah virus is classified internationally as a biosafety level 4 (BSL4) pathogen, but if the samples are inactivated on collection, it can be handled in a BSL2 laboratory.
- The diagnosis of Nipah virus relies on viral isolation, histology, serology (serum neutralization, ELISA and immunofluorescence assays) and PCR.
- Since the virus emerged in 1998, the virus has affected 637 individuals and killed 373 of them (59%).
- Human infections range from asymptomatic infection to fatal encephalitis. After an incubation period of 4-18 days, patients present with flu like illness with fever, muscle ache, nausea and vomiting followed by seizures and deterioration in level of consciousness due to encephalitis which can appear acutely or gradual over a prolonged period.
- Although this is a priority disease on the WHO R&D Blueprint, currently there is no therapeutic agent or vaccine against Nipah virus and treatment is supportive.

MODE OF TRANSMISSION

- The virus is transmitted to humans through three main routes:
    - 1) Directly from contact with infected asymptomatic bats or its secretions (saliva, urine, semen and excreta). The large Bangladesh outbreak in 2001 was eventually attributed to drinking fresh palm tree sap contaminated with fruit bats.
    - 2) The most common route of transmission is through contact with infected pigs by farmers. This was clearly documented in the large outbreak between February and April 1999 among pig-farmers in Malaysia which rapidly spread to neighboring towns in Singapore among farms importing pigs from Malaysia. The virus is highly contagious among pigs, spreading through coughing.

- 3) Human to human transmission has been documented in the India outbreak in 2001 and the Bangladesh outbreak in 2004 through contact with infected person's secretions, excretions, blood or tissues.

IDEAL INFECTION CONTROL PRACTICES INCLUDE THE FOLLOWING:

- Health care workers should strictly adhere to universal precautions in the management of patients with known or suspected Nipah virus infections.
- The use personal protection such as masks, goggles, gloves, gowns, and boots are advocated for all direct patient care.
- Use readily available common disinfectants to kill the virus.
- Limit human contact to bats will eliminate the risk of transmission from direct contact with bats and its secretion and excreta.
- Educate farmers and villagers about the risk of transmission of Nipah virus through contaminated raw tree sap from bat secretions.
- Avoid consuming raw date palm sap or toddy; consume only washed fruits; avoid consuming half-eaten fruits and avoid entering into abandoned wells.

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