Nipah Virus

Disease Profile

Two members of the genus *Henipavirus* in the family Paramyxoviridae, Nipah virus (NiV) and Hendra virus (HeV) can infect and cause disease in number of mammalian species including humans, monkeys, pigs, horses, cats, dogs, ferrets, hamsters and guinea pigs. NiV infections of human and domestic animals have now been documented in Malaysia, Bangladesh and northern India with case fatality rates reaching almost 90% in some outbreaks. To date (2017) close to 600 human cases of NiV disease in humans have been reported. **Person-to-person** transmission has been documented. **Fruit bats** (flying foxes) in the genus Pteropus are the natural hosts for NiV and HeV. NiV infection of pigs is characterised by fever with respiratory involvement and nervous signs have been frequently reported. Low mortality rates are generally reported and asymptomatic infections appear to be common. **Pigs** are known to shed virus in respiratory secretions and saliva. Natural infection of dogs with NiV causes a distemper-like syndrome with high mortality rates. Field infections have also been reported in cats and horses, with fatalities observed in both species.

Risk

This is a **re-emerging zoonosis with a high case fatality rate in humans.** The zoonosis appears to be limited to certain countries in Asia with fruit bat populations. The direct impact on farms and the pig industry may be significant as the first intervention will very likely be culling. In Malaysia, over one million pigs were culled to stop spread of the disease in the original outbreak. Mass culling and carcass disposal can represent a major logistical problem due to the dangerous zoonotic nature of the agent. There is a high disruption to pig meat production and trade in affected areas. The ease with which NiV can be grown, its highly pathogenic nature and its broad host range making it a potential agent for bioterrorism.

What do we have?

Diagnostics: Diagnosis of NiV infection is by virus isolation, detection of viral RNA or demonstration of viral antigen in tissue collected at necropsy. The complete genome of NiV has been sequenced and PCR-based methods have been used to detect the virus and are being validated in a number of laboratories. The availability of safe laboratory diagnostic tests is limited and is non–existent in low biosafety conditions.

Vaccines: There are **no vaccines** currently available for NiV although promising results were reported from experiments in swine, cats, and hamsters.

Pharmaceuticals: No specific treatment is available for veterinary purposes and, if available, the use of therapeutics would be problematic given biosecurity concerns regarding exposed animals.

What do we need?

- **In-depth knowledge** concerning many aspects of the distribution, epidemiology, pathogenesis and control of NiV.
  - Research towards the immunology, ecology, maintenance and transmission of NiV in bat populations.
  - Knowledge about routes of infection, susceptibility, infectious doses and intra- and inter-species transmission of NiV in all known susceptible species (pigs, dogs, cats, goats, cattle, horses).
- **Diagnostic tests suitable for low containment laboratories.**

Read the full chapter here.