



## NIPAH Virus Advisory

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### **Background:**

Since the evolution of human life, human beings have been afflicted with viral infections. In fact viral afflictions have affected our species even before we had evolved into its modern form. In case of certain viral infections, vaccines and antiviral drugs have not only allowed us to keep infections from spreading widely, but also have helped sick people recover. Effective public health measures have helped us to surmount one such infection – smallpox. We have been able to eradicate it, ridding the world of new cases.

But the recent Nipah Virus outbreak in India demonstrates that we are still a long way from winning the fight against viruses. This highly pathogenic infection, with case fatality rate, ranging from 40 to 75% has already claimed 12 lives in a recent outbreak in Kerala.

### **Focus of infection:**

Human Nipah virus (HNiV) infection was first recognized in a large outbreak of 276 reported cases in peninsular Malaysia and Singapore from September 1998 through May 1999. Pigs were identified as the intermediate hosts during the outbreak.

However subsequent outbreaks proved that infection could be transmitted without an intermediate host.

HNiV was again identified as the causative agent in an outbreak of human disease occurring in Bangladesh in 2001. On genetic sequencing, the causative Nipah virus agent strain was identified as belonging to a different from the one in 1999. HNiV infections have been reported to occur on annual bases in Bangladesh from 2001 to 2008 occurring between December and May. 135 cases of HNiV have been attributed to these outbreaks with 98 deaths. In addition 17 other transmission events with each event ranging from single cases to clusters of 2-4 have also been recognised in Bangladesh.[1] Similar outbreaks have been reported from India. An outbreak of HNiV was identified in Siliguri (West Bengal), in 2001 with reports of person-to-person transmission in hospital settings (nosocomial transmission). The outbreak saw 66 cases and 45 deaths. An outbreak in Nadia West Bengal (2007) reported 5 cases and 5 deaths (100% mortality).

The recent outbreak in Kerala has led to 10 deaths so far. The outbreak which started with two siblings of the same family and a care giver to them succumbing to the disease has taken 10 lives till last reports came in. A history of direct contact with a dead bat was found in the family. Serologic evidence for NiV has been found in the known natural reservoir (Pteropus bat species) and several other bat species in a number of countries, including Cambodia, Thailand, Indonesia, Madagascar, Ghana and the Philippines, making it a disease of public health concern

### **Transmission**

HNiV may be transmitted through direct contact with infected Bats, pigs or person to person with large fruit bats of the genus Pteropus appearing to be the natural reservoir of NiV. Reports have not been able to identify rodents and other animals as wildlife reservoirs for NiV. In Malaysia the growth of large intensively managed commercial pig farms with fruit trees could have created an environment where bats could drop partially eaten fruit contaminated with NiV laden bat saliva into pig stalls. The pigs on eating the fruit could become infected with NiV, and thereafter transmit virus to other pigs on the farms, frequent respiratory shedding of the virus among infected pigs and the pigs' high birth rate that regularly brought newly susceptible young pigs into the population at risk. However in contrast to the Malaysia-Singapore porcine epidemic leading to a human epidemic, in Bangladesh NiV transmission from bats to human was repeated and is an ongoing event. The type of NiV strains isolated from Bangladesh supports a theory of multiple introductions of the virus from bats into human populations within a single year.

Broadly there are three ways by which infection may be transmitted from the bats to the human population. It can happen through ingestion of fresh date palm sap as

happened in the epidemic of 2005 in Bangladesh whereby maximum people affected developed symptoms during these months, or through domestic animals that consume fruit partially eaten by the bats or consume contaminated sap. Another route is when some people may come into direct contact with NiV infected bat secretions.

For persons to person transmission respiratory secretions seem to be important in transmission of NiV. As NiV RNA has been identified in the saliva of infected persons, sharing food and utensils, sharing the same bed, hugging , kissing ,being close to a coughing patient could transmit the infection.[2]

### **Signs and Symptoms**

Nipah virus infection primarily manifests as encephalitis. However, the symptomatology may vary from being asymptomatic to influenza-like symptoms like fever, sore throat, headaches, vomiting and muscle pain (myalgia). The infection may manifest as atypical pneumonia and progress to acute respiratory infection (mild to severe) with respiratory distress. The incubation period may vary from four to 18 days, although an incubation period of as long as 45 days has been reported. Nipah virus encephalitis presents with 3-14 days of fever and headache, followed by drowsiness, disorientation and mental confusion, progressing to coma within 24-48 hours. Some of the patients show both severe neurological signs and pulmonary signs.

Long-term sequelae following Nipah virus infection in the form of persistent convulsions and personality changes have also been noted. Importantly, Latent infections with subsequent reactivation and death have also been reported months and even years after exposure to Nipah Virus. [3]

### **Diagnosis**

Laboratory diagnosis through Virus isolation and real time polymerase chain reaction (RT-PCR) from throat and nasal swabs, cerebrospinal fluid, urine, and blood can be performed in the early stages of a patient with a clinical history of NiV, while antibody detection by ELISA (IgG and IgM) can be used later on. Immunohistochemistry on autopsy may be the only way to confirm a diagnosis in fatal cases.

### **Treatment**

Treatment is limited to supportive care. Ribavirin has been found to be effective in vitro, however human trials have been inconclusive

### **Prevention**

The best prevention strategy is to avoid contact with sick pigs and bats, avoid consuming fruit fallen on the ground or date sap in endemic areas, prevent contact of domestic animals with infected pigs and preventing them from consuming fruit or sap likely to be contaminated, in endemic areas. Further, creating awareness among people on likely modes of transmission, and recognition of early symptoms and reinforcement of standard infection control practices and proper barrier nursing techniques to contain nosocomial infections with, strengthening of the laboratories for early detection in animals and humans will go a long way in preventing NiV infection.

**References:**

1. Nipah Virus (NiV) | CDC. Available online at: <https://www.cdc.gov/vhf/nipah/index.html>. Last accessed: 2018-05-25
2. Luby SP, Gurley ES, Hossain MJ. Transmission of human infection with Nipah Virus. *Clinical infectious diseases: an official publication of the Infectious Diseases Society of America*. 2009; 49(11):1743-1748.
3. Signs and Symptoms | Nipah Virus (NiV) | CDC. Available online at: [https //www.cdc.gov/vhf/nipah/symptoms/index.html](https://www.cdc.gov/vhf/nipah/symptoms/index.html). Last accessed: 2018-05-25