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## AN OVERVIEW ON NIPAH VIRUS

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### ABSTRACT

Nipah virus is a pocket RNA virus responsible for severe encephalitis outbreaks mostly in the Indo Bangladesh region. The Nipah virus is the cause of the zoonotic sickness known as Nipah viral disease. (NiV), a paramyxovirus of the genus Henipaviral in the family Paramyxoviridae. This disease was first reported in 1998 in Kampung Sungai Nipah village, Malaysia. Depending on the nature of the virus, NiV patients may develop neurological symptoms and serious respiratory illnesses. Various diseases can be transferred to humans as well as animals. Interesting, the infection pattern between different hosts varies across region due to different exposure methods, diet, and recently discovered genetic/molecular signatures of major diseases associated with violence. This paper represents the transmission, epidemiology, diagnosis and prognosis of nipah virus. Due to the high prevalence and potential of this disease, NIV diagnosis needs to be incorporate into a more global health system to improve public health surveillance and planning.

**Key words: Nipah virus, epidemiology, prognosis, diagnosis**

### INTRODUCTION

The name "Nipah" comes from a village in Malaysia that first appeared in 1998 Diseases such as bird flu, swine flu, Middle East respiratory syndrome coronavirus

(MERS-CoV), severe acute respiratory syndrome (SARS), Crimean Congo haemorrhagic fever (CCHF), Lassa fever, Rift Valley fever (RVF), Marburg virus, Ebola virus, Zika virus, Nipah virus, and Hendra virus pose a significant risk of global health emergencies. This study aims to characterize the NiV virus in terms of infectious potential and evaluate the effectiveness of previous prevention and intervention measures. Results and observations from these analyses can inform the development of action plans to prevent local outbreaks. The host of this disease is the fruit eating bat of the genus *Pteropus*, or the so called "flying fox" creature. The main NiV outbreaks to date have occurred in bat carrier geographic areas such as Malaysia, Singapore, Bangladesh, and India, but cases have also been reported in the Philippines. The emergence of this disease and the potential for zoonotic transmission to animals and humans appears to be related to the loss of bat habitat [4]. Types of transmission are different: pterosaur-pterosaur, pig-human, human infection through contaminated food, direct infection between bats and humans is also considered. When a disease occurs in pigs, the only precautions to be taken are isolation.

### 3.1 NIPAH VIRUS

Nipah virus (NiV) is a zoonotic disease (transmitted from animals to humans) that can spread through contaminated food or directly from person to person. It causes a variety of symptoms in patients, ranging from asymptomatic (subclinical) to severe respiratory disease and death [7]. Nipah virus is an enveloped paramyxovirus with negative strand polarity and a non-segmented RNA genome consisting of a helical nucleocapsid. NiV has little difference in composition compared to other paramyxoviruses [1]. Nipah virus (NiV) is an infectious disease caused by an 18,000-nucleotide-long negative RNA virus that originates in Southeast Asia and belongs to the family Paramyxoviridae and genus Henipavirus. This genus also includes other viruses that can infect humans, such as Ghana bat virus, Mojiang virus, and Hendra virus (HeV) [5].

### 3.2 TRANSMISSION OF NIPAH VIRUS

When the disease first emerged in Malaysia, which has also affected Singapore, most people became infected through direct contact with infected pigs or their tissues. Transmission is thought to occur through unprotected contact with pig secretions or tissues of infected animals. (e.g. dried fruit juice) Urine or saliva from infected fruit is the most likely source of infection. There are also cases of human-to-human transmission [7].

Nipah virus is a zoonotic disease and the source and vector of transmission and reproduction are wild and domestic animals. In some cases of NiV infection, the emergence of the disease in humans has been associated with the presence of different strain depending on the location of the outbreak. Initially, studies on animal NiV reservoirs focused on bats, where a similar NiV species, HeV, had previously been detected (Chua, 2003). The presence of NiV has been confirmed in the species *Pteropus hypermela*, *Pteropus lylei* and *Pteropus vampyrus* in Malaysia (Sharma *et al.*, 2019). The first studies showing NiV vectors in India were conducted in insectivorous insects (*Megaderma spasma*), but its presence was finally confirmed in fruit trees of the *Pteropus* genus, such as *Pteropus giganteus* (Plowright *et al.* 2019; Thakur and Bailey, 2019). Following the discovery of NiV cases in India in 2019, the presence of the virus and IgG antibodies were confirmed in *P. medius* bats (Sudeep *et al.*, 2021). Infected bats and Indian patients had the highest prevalence of NiV compared to Malaysia, Cambodia, and Bangladesh; This clearly shows that bats are more likely to infect humans when infected with this virus [3].

**3.3 EPIDEMIOLOGY** The first outbreak of Nipah virus in Malaysia and Singapore 1998&1999 was initially thought to be

Japanese encephalitis (JE), but upon further investigation it was identified as Nipah [9, 10, 11]. The second outbreak of this disease occurred in 2001 in an endemic area of Meherpur district of Bangladesh and Siliguri city of West Bengal state of India. The IndoBangladesh outbreak differs from previous outbreaks in Malaysia in terms of epidemiology, clinical location and case fatality, human transmission and nosocomial transmission (via droplets and/or particles) are the main causes of this phenomenon. In addition, compared to the epidemic in Malaysia, it was observed that the second disease was more common and the disease was more severe and progressive. Human-to-human and hospital acquired transmission has also been documented in the IndoBangladesh outbreak. In 2001, there was an epidemic in Siliguri, a patient who went to a private hospital infected 23 hospital staff and 8 visitors with the virus [12]. In Malaysia, a huge variety of animal are raised in pig farms, an area wherein NIV infection can unfold as an inter animal infection, but slaughterhouses additionally play a function inside the spread/contagion, as they're places in which a leap between animal species, i.e., pig-to-man, can arise. Swine is taken into consideration a organic reservoir for contamination and turns into infected by means of eating fruit bitten by

means of NiV-carrying bats. at some point of the 1998 outbreak, the puppies gift in the pig farms have been also located infected and this

obviously represents a in addition source of capacity hazard for the transmission of Niv to people [13].

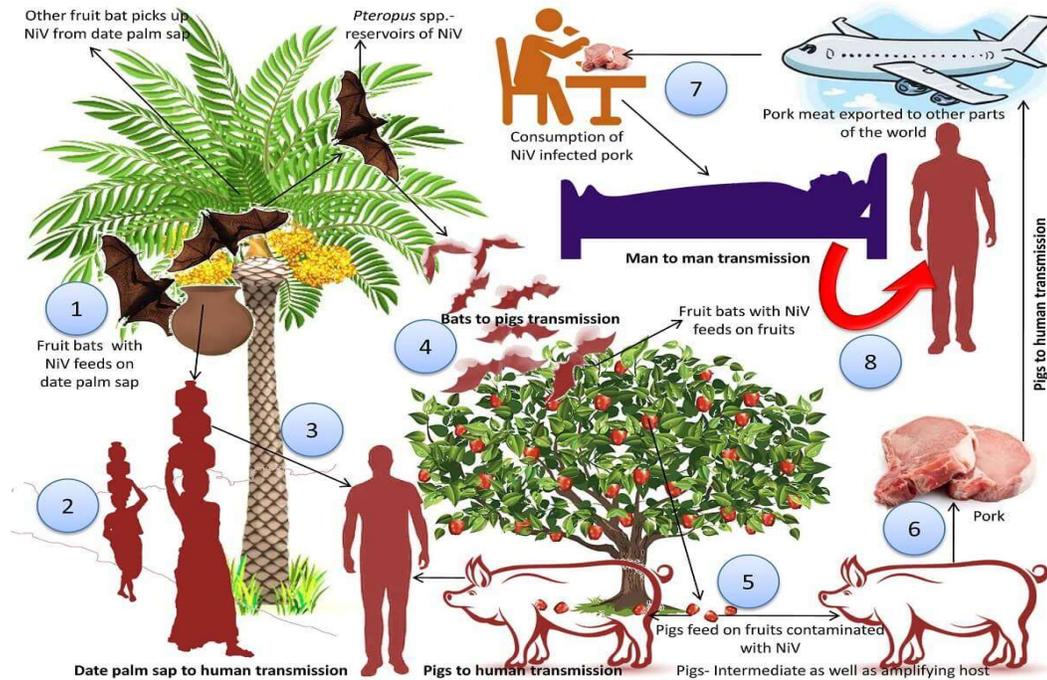


Figure 1: Epidemiology of Nipah Virus

**3.4 CLINICAL FEATURES:**

clinical functions of Nipah usually consists of fever with encephalitis and or respiration involvement [14, 15, 16]. The incubation period of NiV ranges from 4 to 21 days. NiV primarily causes acute encephalitis and respiratory disease and is highly fatal. A small percentage of those infected are asymptomatic [21] capabilities of encephalitis increase inside per week, with the most not unusual signs being altered intellectual fame, areflexia, hypotonia, segmental myoclonus, gaze palsy and limb weakness. patients become worse rapidly and coma and demise

follow within some days. Residual neurological deficits are seen in 20% of survivors and variety from fatigue to focal neurological deficits and depression [22].

**3.5 DIAGNOSIS**

Due to the shortage of a powerful drug in opposition to NiV, the management of patients is confined to supportive and prophylactic remedy. The basic scientific practices inside the case of confirmation of NiV infection are upkeep of airway patency, prophylaxis of venous thrombosis, and renovation of fluid and electrolyte stability. Mechanical air flow is utilized in excessive

breathing signs and symptoms. people inflamed with NiV are also given broad-spectrum antibiotics. diverse lively substances have been tested inside the look for a drug that inhibits NiV proliferation. but, the effectiveness of ribavirin administered for the duration of the epidemic in Malaysia is controversial, as is the effectiveness of acyclovir utilized in Singapore [3]. Enzyme linked immunosorbent assay (ELISA): Used to detect NiV antigen and measure antibodies. This is a simple and inexpensive way to analyze suspicious samples [17]. This serological test uses several methods: ELISA detection using monoclonal antibodies to detect NiV and distinguish it from HeV forms and even from forms that use the recombinant N protein of NiV. Indirect ELISAs for IgG and IgM have also been developed to test porcine and human sera and have also been described for the detection of seroconversion in bats. Another variation of this technique is the sandwich ELISA, which uses rabbit polyclonal antibodies directed against the NiV G protein. Disease Laboratory [HSADL], Bhopal, India) [4].

### 3.6 PROGNOSIS

The serological test uses several methods: ELISA detection using monoclonal antibodies to detect NiV and distinguish it from HeV forms and even from forms that use the

recombinant N protein of NiV. Indirect ELISAs for IgG and IgM have also been developed to test porcine and human sera and have also been described for the detection of seroconversion in bats. Another variation of this technique is the sandwich ELISA, which uses rabbit polyclonal antibodies directed against the NiV G protein. Disease Laboratory [HSADL], Bhopal, India [18, 19]. Spread typically requires direct contact with an infected source; it can both spread between people and from other animals to people. Diagnosis is based on symptoms and confirmed by laboratory testing [20]. Infection usually requires direct contact with the source of infection; Diagnosis is based on symptoms and confirmed by laboratory tests [18, 19].

As of 2021, control is limited to supportive care, there is no vaccine or specific treatment, and precautions include avoiding contact with infected animals such as bats and pigs and not drinking fruit juice. It is estimated that approximately 700 people have been infected with Nipah virus as of May 2018, and 50% to 75% of cases have died.

### 3.7 DISEASE PREVENTION

Given that effective treatment is limited and a vaccine is unavailable, it seems necessary for researchers and organizations to monitor the threat to focus on preventing and effectively monitoring the coronavirus outbreak.

Prevention strategies to prevent new infections and the spread of existing diseases are mainly to avoid direct contact with diseases (fruit bats and pigs) and their secretions and to avoid eating contaminated food. On the one hand, it is recommended to carefully examine and wash the fruits of the trees where they live. On the other hand, methods to limit their access to the place and container where coconut palms are collected (bamboo method) are used (Ambat *et al.* 2019; Sharma *et al.* 2019). It is also recommended not to plant fruit trees that will near houses (Ang *et al.*, 2018). Appropriate protective clothing should be used in jobs requiring react contact with farm animals, especially during slaughter and disposal [3].

### 3.8 CONCLUSION

Henipavirus NiV has emerged continuously for 22 years and has caused many epidemics in many places, causing many deaths. Scientists predict that NiV will likely be the next pandemic after Covid-19. A One Health approach focusing on animal-human environment interactions is urgently needed to prepare for future epidemics. The process must take into account animal health care or animal health management, human health and environmental health [8].

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