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REVIEW ARTICLE

A REVIEW ON SPREADING OF NIPAH VIRUS IN KERALA

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ABSTRACT

Nipah virus causes encephalitis in humans and has a high fatality rate. Species of fruit bats in the pteropus genus are the presumed natural reservoir of Niv. Niv has been isolated and or Niv RNA has been identified or observed in bats in Malaysia; Cambodia; Thailand; Bangladesh (west Bangladesh); and recently in INDIA at Kerala. The Nipha virus has kills 16 lives, including a nurse

Key words: *Nipah virus, Kerala, kumpung sugai Nipha.*

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INTRODUCTION

Nipah virus causes encephalitis in humans and has a high fatality rate. Species of fruit bats in the pteropus genus are the presumed natural reservoir of Niv. Niv has been isolated and or Niv RNA has been identified or observed in bats in Malaysia; Cambodia; Thailand; Bangladesh (west Bangladesh); and recently in INDIA at Kerala. The Nipha virus has kills 16 lives, including a nurse.In late 1998 and early 1999, an outbreak of acute encephalitis with high mortality rates among pig handlers in Malaysia. This virus can kill the hundreds of them. To the discovery of a novel paramyxovirus named Nipah virus. This virus was subsequently named Nipha virus after *kumpung sugai Nipha* (it s a Nipha river village) where the 1st viral isolates were obtained. After that during Jan – Feb. of 2001 an outbreak of febrile illness with altered sensorium was obtained in *siliguri,* west Bengal (India). The outbreak occurred among hospitalized patients; family contacts of the patients and medical staff of hospitals. Japanese encephalitis which is endemic in this area was initially suspected a different disease. Now recently in India an outbreak of NIPHA re-emerged at Kerala there is no evidence to suggest that the Nipha virus in Kerala was transmitted by fruit bats as suspected initially. Nearly about 19 peoples are suffered with this disease out of them 17 are died.

Structure of Nipah Virues

WHAT IS NIPHA?

It's an emerging zoonotic (the virus that transmitted from animals to humans) pathogenic disease with disturbing abilities.

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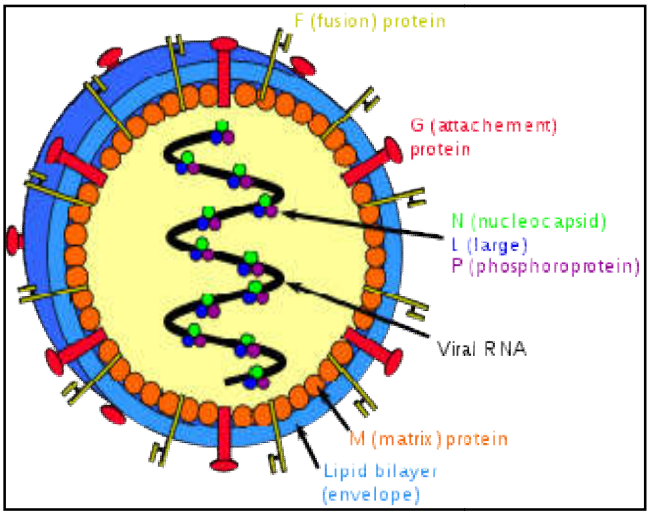
And causes death to humans, But they can show the asymptomatic in flying fox i.e. fruit bats (pteropodidiae) and often infects animals such as pigs.

How it's Infected?

- Humans are contact with directly or by in directly contact with infected carriers like pigs and bats this way can cause this disease
- The consumption of raw date palm sap containing contaminated with bat feaces this is the way to get the disease
- Infected human to human transmission or virus transmitted to their family members or transmission to the hospital staff like doctors, nurses, ward boys, etc

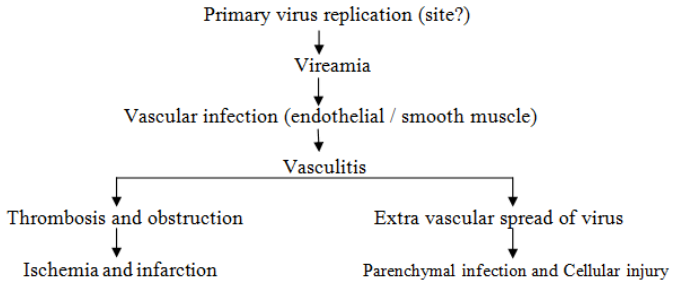
EPIDEMIOLOGY

- In 1999 at *Malaysia* an outbreak, of Nipha virus this disease can file *300 human cases* with over 100 DEATH were reported. To stop the outbreak more than millions of pigs were euthanized, causing tremendous loss for Malaysia.
- In *Bangladesh* from *2001 – 2015* nearly *298 human cases* are filed out of *209 are killed* 70% of mortality rate has been observed in Bangladesh.
- In India, From Bangladesh this virus can cross the border twice this outbreak occurred in 2001 and 2007 in the districts of *Siliguri and Nadia, in west Bengal*, India killing 70 deaths were reported.
- In south India at *Kerala* Nipha had smashed the lives of *17 humans* out of 19 in *2018* and the mortality rate was 89% has been observed.



Aetiology: Its majorly transmitted by FRUIT BATS AND PIGS these are act as the intermediates which can transmitted this disease. Incubation period is 14 days.

Pathophysiology: By preliminary autopsy findings the major target of this virus is the CNS. Endothelial syncytia, comprised of multi nucleated giant endothelial cells are frequently found in NiV infections and are mediated by the fusion and the attachment envelope glycoproteins. Ephrin $B_2$is a functional receptor for NiV. Ephrin B2 is expressed on endothelial cells and neurons, which is consistant with the known cellular tropism for NiV. Firstly the virus replicate at the specific site and causes vascular infection which leads to vasculitis and causes thrombosis and abstruction which leads to ischemia and infraction. Some times it spreads extra vascularly and causes parenchymal infections and cellular injury.



Symptoms: Encephalitis (brain inflammation); nerve disorders; respiratory problems; fever; headache; myalgia; sore throat; vomiting; dizziness.

Diagnosis: Serological test; CBC; RTPCR (Reverse Transcriptions Polymerase Chain Reaction) and Virus isolation; swab examination, antibody detection by ELISA test.

Treatment: There is no particular treatment for nipah virus. Right now to decrease symptoms RIBAVIRIN is generally suggested by the physician. A monoclonal antibody targeting the viral G glycoprotein has been beneficial in a ferret model of the disease.

Ribavirin: Now these are the commonly used drugs in anti viral infections like HCV; RSV infection; viral hemorrhage and right now it's a drug for NiV infection it can't cure the disease but it reduces the symptoms.

Mechanism of action: It is a guanosine (ribonucleic) analog used to stop viral RNA synthesis and viral mRNA capping, thus, it is a nucleoside inhibitor. Ribavirin is a prodrug, which when metabolized resembles purine RNA nucleotides. In this form, it interferes with RNA metabolism required for viral replication. Over five direct and indirect mechanisms have been proposed for its mechanism of action. Combined chloroquine and ribavirin treatment does not prevent death in a hamster model of NiV and HeVs infection. As ribavirin and chloroquine proved to be active in inhibiting henipavirus release from infected cells, we asked whether both drugs would show an increased antiviral effect when given in combination, indicative of a favourable drug–drug interaction. To investigate this, we challenged 8–10-week-old hamsters with a lethal dose of 104 TCID50 of NiV or HeV, and treated them with chloroquine and ribavirin post-challenge. Cell culture experiments showed the effectiveness of both drugs in inhibiting virus spread when added up to 12 h Based on these results and a likely best-case post-human-exposure scenario, we chose to initiate treatment at 6 h and compared the survival rate of animals receiving the following drug.

Treatment: (i) five animals received ribavirin individually at a dose of 30 mg kg−1 every 12 h. (ii) five animals received chloroquine individually at a dose of 50 mg kg−1 every other day, and (iii) five animals received a combination of ribavirin and chloroquine using the described concentrations and dosing schedules. Virus-infected control animals received vehicle solution only, and control animals received drugs only. Hamsters were observed daily, and body weight, temperature and clinical signs were recorded.

Spreading of Nipah virus in Kerala

At around 2 a.m. on May 17 morning, a grievously sick Mohammed Salih, a 28-year-old architect from Kerala's Perambra town, was rushed by his family to Kozhikode's Baby Memorial Hospital. Salih was vomiting, had a high fever, and was in a mentally agitated state. The doctor on call, critical care physician A.S. Anoop Kumar, knew these symptoms meant encephalitis, an inflammation of brain tissue that kills hundreds in India every year. Kumar tried to stabilise Salih, but by around 9 a.m., when the hospital's neurologists came to examine him, it was obvious that something was very wrong.Even though Salih was receiving top-end care, his condition was worsening rapidly. He had some very peculiar symptoms, recalls Chellenton Jayakrishnan, one of the neurologists who treated him. His heart was racing at over 180 beats per minute and his blood pressure had shot up. His limbs were limp, displaying no reflexes. These symptoms were unlike any encephalitis cases that the team had ever seen. Jayakrishnan and his colleagues ruled out, one by one, dozens of common causes of encephalitis. Salih couldn't have Japanese encephalitis. The mosquito-borne infection typically doesn't affect more than one person in a household, and his younger brother, Sabith, had died about 12 days ago after showing similar symptoms. His father and aunt, too, had contracted the infection.

Rabies, another possible cause of encephalitis, was ruled out too. "If the family had been exposed through a common pet, they would have fallen sick at the same time," says Jayakrishnan. Salih had fallen sick days after Sabith did. So, was this a case of poisoning? The team ruled this out, too. Toxins could trigger encephalitis-like symptoms but were

usually not accompanied by fever. Virologist Arun Kumar head of manipal centre of viruses and research and doctors at baby memorial hospital comes to conclusion that the recent attack with encephalitis in kerala is a nipah virus. The nipah virus around Kozhikode, kerala by the checking of the sample of the first patient Sahib of first day. Arunkumar was interested in testing for Nipah for two reasons. First, among the States covered by his surveillance project were Tripura and Assam, both across the border from Bangladesh and potential geographies for Nipah. Second, the virus is thought to be a probable bioterrorism agent. So, in August 2017, the MCVR team was trained by the United States' Centers for Disease Control and Prevention to test for the Nipah virus. This made the Manipal laboratory only the second facility in India capable of doing so, apart from Pune's National Institute of Virology (NIV). It was a serendipitous move. When Arunkumar received Salih's samples on May 18, he also ruled out common causes of encephalitis such as the Japanese encephalitis virus, the Herpes Simplex virus and Leptospira bacteria. Only one pathogen seemed capable of causing Salih's symptoms and leading to sickness among several family members at the same time. "It was Nipah," says Arunkumar. He was interested in testing for Nipah for two reasons. First, among the States covered by his surveillance project were Tripura and Assam, both across the border from Bangladesh and potential geographies for Nipah. Second, the virus is thought to be a probable bioterrorism agent. So, in August 2017, the MCVR team was trained by the United States' Centers for Disease Control and Prevention to test for the Nipah virus. This made the Manipal laboratory only the second facility in India capable of doing so, apart from Pune's National Institute of Virology (NIV). It was a serendipitous move.

Victim: 26yr old sabith died on may 5 including him 17 people also lost their lives .Sabith first came as outpatient at Parambra hospital for high fever and body pains on may2 ,On may 3rd he was admitted into hospital and it is suspected that four people including a night duty sister lini,picked the virus from him. As his condition was worsened he is shifted to the medical college hospital on may 4 for CTscan where he was died on may 5.His younger brother admitted to the hospital with same symptoms and the test revealed that he is nipah positive .at last he was also died.Then the strict rules were passed by the government of kerala and after that no nipah infected person was suspected till may 30.

Health dept's Honour: Meanwhile, the Department of Health is honoring the team at an event to be held at Nalanda Auditorium on Sunday. Doctors who were noted for their exemplary service in 2017-18 will also be honored on the occasion by Minister for Health and Social Justice K.K. Shylaja. Excise and Labour Minister T.P. Ramakrishna will preside over the function, while Transport Minister A.K. Saseendran will be the guest of honour.

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