

Over view of Nipah virus-Review

*M.GURAVIAH

Department of Biotechnology and Microbiology (P.G), J.K.C College, Guntur-6,
Andhra Pradesh, India.

ABSTRACT: Nipah virus infection (NiV) is a viral infection caused by the Nipah virus. Symptoms from infection vary from none to fever, cough, headache, shortness of breath, and confusion. This may worsen into a coma over a day or two. Transmission of Nipah virus to humans may occur after direct contact with infected bats, infected pigs, or from other NiV infected people. In Malaysia and Singapore, humans were apparently infected with Nipah virus only through close contact with infected pigs. The outbreak of the Nipah virus in Kerala is yet another reminder of how fast new viruses can travel from one country to another in a globalised world. Nipah is a relatively new virus which was discovered in 1999 in Sungai Nipah village in the Malaysian peninsula.

KEY WORDS:- Nipah virus, humans, pigs and Malaysian peninsula

Introduction:-

Nipah virus infection (NiV) is a viral infection caused by the Nipah virus.^[2] Symptoms from infection vary from none to fever, cough, headache, shortness of breath, and confusion. This may worsen into a coma over a day or two.^[1] Complications can include inflammation of the brain and seizures following recovery.

The Nipah virus is a type of RNA virus in the genus Henipavirus. It can both spread between people and from other animals to people. Spread typically requires direct contact with an infected source.^[3] The virus normally circulates among specific types of fruit bats. Diagnosis is based on symptoms and confirmed by laboratory testing.^[4]

Management involves supportive care. As of 2018 there is no vaccine or specific treatment. Prevention is by avoiding exposure to bats and sick pigs and not drinking raw date palm sap.^[5] As of 2013 a total of 582 human cases of Nipah virus are estimated and 50 to 75 percent of those who were infected died.^{[7][6]} In 2018, an outbreak of the disease resulted in at least 15 deaths in the Indian state of Kerala.^{[8][9]}

The disease was first identified in 1998 during an outbreak in Malaysia while the virus was isolated in 1999.^[10] It is named after a village in Malaysia, Sungai Nipah. Pigs may also be infected and millions were killed in 1999 to stop the spread of disease.

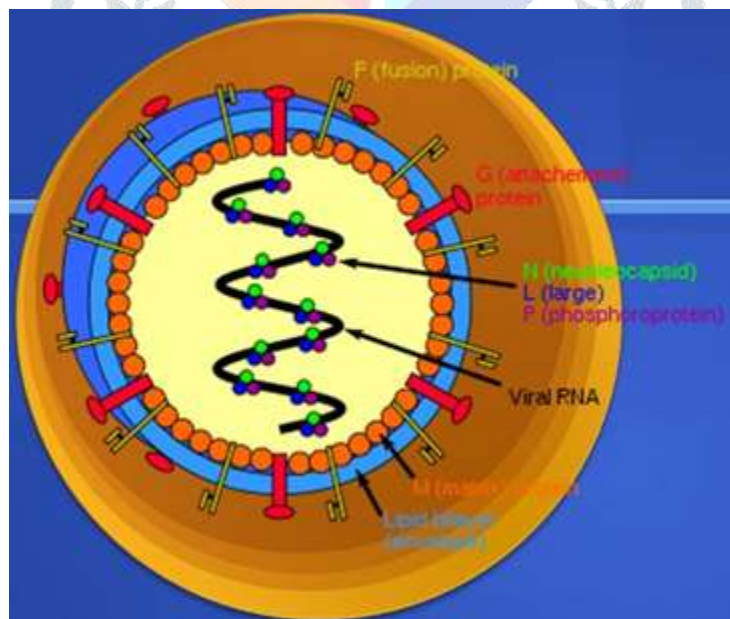


FIG:-Structure of Nipah virus

Signs and symptoms :-

Experts say that Nipah Virus is an airborne transmission infection and can affect those who come in direct contact with contaminated bodies.

Nipah Virus is usually associated with inflammation of the brain due to which severe days of fever can often lead to a state of confusion, disorientation and even persistent drowsiness. If not taken care of, these symptoms can even cause a coma in a span of 24-48 hours. There are many patients who show neurological, respiratory and pulmonary signs as well. Therefore, do not ignore any such signs.

Some common signs and symptoms of NiV are headache, fever, nausea, dizziness, drowsiness and mental issues such as confusion. These symptoms can last up to 7-10 days. Watching out for respiratory illness during the early stages is also a must.

The symptoms may take from four to 14 days to appear after a person gets infected. The early symptoms are not very clear and can easily be confused with that of viral fever and common cold. The virus can kill between 40 per cent to 100 per cent of those infected by it. And you will be surprised to know more than 60 per cent of this infection in humans comes from animals.

Transmission:-

Transmission of Nipah virus to humans may occur after direct contact with infected bats, infected pigs, or from other NiV infected people. In Malaysia and Singapore, humans were apparently infected with Nipah virus only through close contact with infected pigs. The NiV strain identified in this outbreak appeared to have been transmitted initially from bats to pigs, with subsequent spread within pig populations. Incidental human infections resulted after exposure to infected pigs. No occurrence of person-to-person transmission was reported in this outbreak. Conversely, person-to-person transmission of Nipah virus in Bangladesh and India is regularly reported. This is most commonly seen in the family and caregivers of Nipah virus-infected patients. Transmission also occurs from direct exposure to infected bats. A common example is consumption of raw date palm sap contaminated with infectious bat excretions.

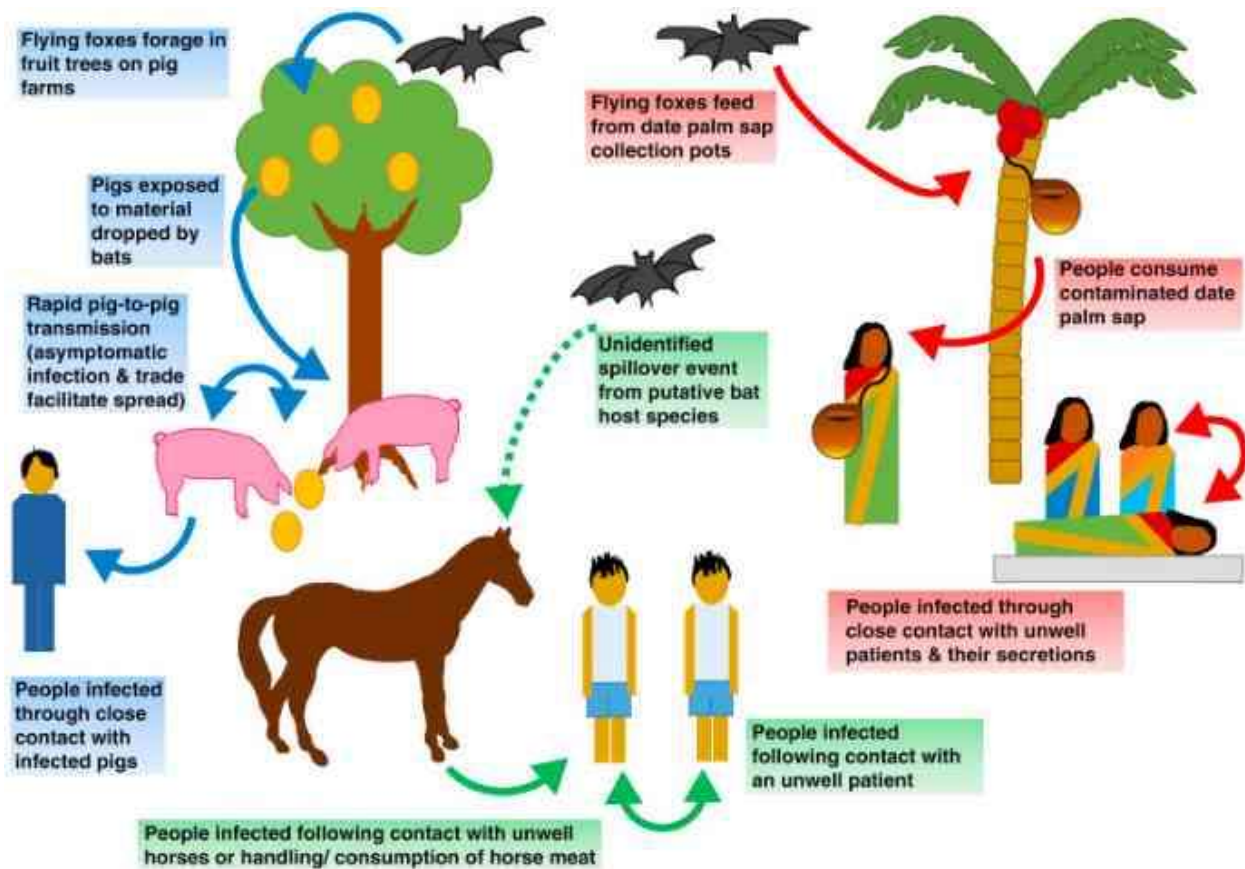


Fig:-Transmission of nipah virus

Outbreak:-

The outbreak of the Nipah virus in Kerala is yet another reminder of how fast new viruses can travel from one country to another in a globalised world. Nipah is a relatively new virus which was discovered in 1999 in Sungai Nipah village in the Malaysian peninsula.

Within a short time, it made its way to Bangladesh which saw nine outbreaks in the year 2001 alone. The same year, Nipah struck in Siliguri, which is strategically located near international borders with Bangladesh, Nepal and Bhutan and sees movement of migratory labour from all sides. Its tropical climate is ideal for viruses to thrive.

The virus strains isolated from Siliguri was closely linked to that from Bangladesh and not to that isolated in Malaysia. After Siliguri, Nipah killed five people in Nadia, also in West Bengal, in 2007. Now, Nipah has surfaced in Kozhikode and Mallapuram. However, it still not quite clear whether the outbreak is a result of circulating virus within India or is of imported origin.

After the 2001 Siliguri outbreak, experts had warned of outbreaks elsewhere. The team of experts that investigated the outbreak reported that 45 deaths in Siliguri were either due to Nipah or closely related Hendra virus.

There was clear evidence of human-to-human transmission, but no evidence of any occurrence in animals. The team had underlined the need for a strong surveillance system backed by modern laboratories for handling and diagnosing new pathogens.

At a scientific conference in 2008, an expert from Dhaka-based International Centre for Diarrheal Disease Research in Bangladesh warned that Nipah was spreading in rural areas of Bangladesh and India and that it had high mortality rate — killing up to three-quarters of those infected.



FIG :- Outbreak of Nipah Virus

scientists from Bhopal's High-Security Animal Disease Laboratory reiterated a few years later that “preparedness, surveillance and constant vigil would have to be mounted continuously in the country,” in view of the fact that antibodies of Nipah had been found in bat populations in the Northeast as well as north-west states like Haryana. The presence of antibodies indicates that the virus may be circulating among bats.

However, scientists are still not clear about exact transmission route of Nipah because every outbreak has presented a different picture. In Bangladesh outbreaks, fruit bats contaminated palm sap which people consumed and got infected.

The involvement of pigs and even dogs in the transmission chain of Nipah can't be ruled out. Despite warnings from time to time, Nipah has resurfaced.

This means India's disease surveillance system is still not robust enough. While the Integrated Disease Surveillance System exists, serious gaps have been found in implementation on the ground.

Studies done to assess its effectiveness have shown that it's not as intense as it's supposed to be and by the time new infections are likely to be detected, the disease would have already spread. Training and retraining of health workers, who are supposed to be the eyes and ears of the surveillance system, too are lacking.

Laboratory network for quick diagnosis also needs to be expanded and strengthened. Hopefully, Nipah will spur the much-needed action and investment to strengthen basic healthcare system.

Prevention and cure :-

As of now, there is no particular vaccine available purely for the treatment of Nipah Virus. The only way to treat this virus is through intensive supportive care. Since drinking raw date palm sap bitten by a bat can also cause NiV, it is safe to say that you should stay from consuming date palm for some time. Hospitals also need to raise awareness about symptoms and transmission to avoid human-to-human infections in such settings. Detection is another issue with NiV and anyone who feels the symptoms should get tested thoroughly from a recognized facility.

Protection

Avoiding direct contact with infected pigs, bats and humans in endemic regions should be practiced. Health professionals attending to such patients should take precautionary measures, such as wearing masks and gloves. If you feel uneasiness when in and around an infected region, get yourself tested immediately!

Treatment:-

Currently there is no effective treatment for Nipah virus infection. The treatment is limited to supportive care. It is important to practice standard infection control practices and proper barrier nursing techniques to avoid the transmission of the infection from person to person. All suspected cases of Nipah virus infection should be isolated and given intensive supportive care. Ribavirin has been shown effective in *in vitro* tests, but has not yet been proven effective in humans. Passive immunization using a human monoclonal antibody that targets the Nipah G glycoprotein has been evaluated in the ferret model as post-exposure prophylaxis. The anti-malarial drug chloroquine was shown to block the critical functions needed for maturation of Nipah virus, although no clinical benefit has yet been observed.^[11] m102.4, a human monoclonal antibody, has been used in people on a compassionate use basis in Australia and is presently in pre-clinical development.

Diagnosis:-

Laboratory diagnosis of Nipah virus infection is made using reverse transcriptase polymerase chain reaction (RT-PCR) from throat swabs, cerebrospinal fluid, urine and blood analysis during acute and convalescent stages of the disease. IgG and IgM antibody detection can be done after recovery to confirm Nipah virus infection. Immunohistochemistry on tissues collected during autopsy also confirms the disease. Viral RNA can be isolated from the saliva of infected persons.

BIBLIOGRAPHY:-

1. Signs and Symptoms Nipah Virus (NiV). CDC. Retrieved 24 May 2018.
2. WHO Nipah Virus (NiV) Infection. www.who.int. Archived from the original on 18 April 2018. Retrieved 21 May 2018.
3. Transmission Nipah Virus (NiV). CDC. 20 March 2014. Retrieved 24 May 2018.
4. Diagnosis Nipah Virus (NiV). CDC. 20 March 2014. Retrieved 24 May 2018.
5. Prevention Nipah Virus (NiV). CDC. 20 March 2014. Retrieved 24 May 2018.
6. Nipah virus outbreaks in the WHO South-East Asia Region. South-East Asia Regional Office. WHO. Retrieved 23 May 2018.
7. Broder, Christopher C.; Xu, Kai; Nikolov, Dimitar B.; Zhu, Zhongyu; Dimitrov, Dimiter S.; Middleton, Deborah; Pallister, Jackie; Geisbert, Thomas W.; Bossart, Katharine N.; Wang, Lin-Fa (October 2013). "A treatment for and vaccine against the deadly Hendra and Nipah viruses". *Antiviral Research*. 100 (1): 8–13. doi:10.1016/j.antiviral.2013.06.012. ISSN 0166-3542. Retrieved 21 May 2018.
8. Manveena Suri, (22 May 2018). "10 confirmed dead from Nipah virus outbreak in India". CNN. Retrieved 25 May 2018.
9. Nipah virus outbreak: Death toll rises to 14 in Kerala, two more cases identified". *Hindustan Times*. 27 May 2018. Retrieved 28 May 2018.
10. Nipah Virus (NiV) CDC". www.cdc.gov. CDC. Archived from the original on 16 December 2017. Retrieved 21 May 2018.
11. Broder, Christopher C.; Xu, Kai; Nikolov, Dimitar B.; Zhu, Zhongyu; Dimitrov, Dimiter S.; Middleton, Deborah; Pallister, Jackie; Geisbert, Thomas W.; Bossart, Katharine N.; Wang, Lin-Fa (October 2013). "A treatment for and vaccine against the deadly Hendra and Nipah viruses". *Antiviral Research*. 100 (1): 8–13. doi:10.1016/j.antiviral.2013.06.012. ISSN 0166-3542. Retrieved 21 May 2018.

*Corresponding author

M.GURAVIAH

Department of Biotechnology and Microbiology (P.G),
J.K.C College, Guntur-6,
Andhra Pradesh, India.

