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Outbreak of Nipha virus in India

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ABSTRACT

Nipah virus is an newly out broke virus from the animal species the exact reason for the virus out bake was not known clearly some scientist are concluded the point regarding the reoccurrence of the virus in the India after a gap of 8 years of last impact, this virus is mainly spreading because of the a kind of the cattle pigs and from the infected fruit bat. At first virus has been found in the region of the south East Asia islands later few developed countries has taken a step forward in order to control or eradicate the virus while few countries has left the solution for the problem. Recently a week back the virus has been observed in the south state of the India. As it was known fact that this virus is a zoonosis. Various countries are a step ahead in the research. When compared to the west part of the world the impact of the disease is more in the eastern part of the world. There is no particular vaccination for this virus, diagnosis for the disease is also a complex task.

Keywords: Pteropodidae family, Fruit bat, Henipavirus, Ribavirin

INTRODUCTION

Nipah virus is a newly outbreak zoonosis (disease which can be transmitted to humans from animals) natural host of this virus is fruit bats of pteropodidae family. Nipah virus was first found in year 1999 in pig farmers of kampong sungai Nipah region in Malaysia country. Transmission of the disease might be from direct contact with ill pigs' throat or nasal secretion, consumption of fruits or vegetables contaminated with urine or saliva from infected fruit bat.

Signs and symptoms of the infected Human will develop influenza like symptoms like fever, headache, myalgia, sore throat and vomiting along with this condition drowsiness and some neurological changes. Initially patients will be asymptomatic later they develop above mentioned conditions. Encephalitis and seizures occur in severe cases which progressively leads to coma within 24 to 48 hours. The incubation period is between 4 to 14 days. People who survived from acute encephalitis make a full recovery, but long term neurologic conditions have been reported in survivors. [1-5]

Morphology

Nipah virus is a newly created henipavirus genus. Its size is nearly 40 to 600 nm in diameter. Inside it contains a linear ribonucleprotein (RNP)

containing of negative sense single stranded RNA. RNP contain three different type of protein materials they are nucelocapsid proteins (N), phosphoproteins (P) and polymerase protein (L). The virion(complete virus particle) is covered with a traditional lipid bilayer but "spiked" with fusion proteins(F). The fusion proteins are responsible for fusing the viral membrane to the host membrane eliciting the release of the contents of the virion. The receptor-binding glycoporteins are particular bind only to Ephrin B2 (EFNB2) surface proteins which is surface proteins are highly sustained across the mammalian lineage. Not only above mentioned proteins but also proteins like C, V, and W, are also present in the cytoplasm and involved in transcription and replication. Actually in order to activate the immune system intercellular communication is necessary which leads to get rid of the pathogens. Proteins like C, V, and W proteins has a special property of anti-interferon which will block the signalling, the exact mechanism of this proteins is not known and the exact structure of the virus is not understandable. [1, 2]

NiV Virus history

First outbreak of the Niv virus is happened in Singapore in the 20th century as per the data available as of then around 250- 300 people has thougt to died due t the impact of disease. At present the outbreak of the Niv virus is high in the regions of the south- East Asia.in the south-eastren countries like India and Bangladesh has reported human cases of Nipah virus encephalitis. In other south-eastern countries like Indonesia, Thailand has detected antibodies against NiV in the bat population and their source has been isolated, whereas the status of this infection is not found or not detected in the flying bats found throughout the region.

When compare to the india Bangladesh is much familiar with the virus in the year 2001 it was first identified in one of the Bangladesh district after that in every its was commonly and up to March 31, 2012 a total of 209 human cases of NiV infection in Bangladesh were reported; 161 (77%) of them died. [3]

As per geographical distance between Bangladesh and India is very near. In the year 2001 first outbreak of the disease is identified in the west Bengal district which is very close to the Bangladesh country. A second outbreak was reported in 2007 in Nadia district of West Bengal. Around 30 cases of fever with acute respiratory distress and/or neurological symptoms were reported and five cases were fatal. All five fatal cases were found to be positive for NiV by RT-PCR. Recently in the 2018 the third outbreak of this virus has happened but this time this virus has been occurred in the southern state of the india that is kerala it may be due to rapid urbanization, along with changes in the climatatic conditions over the past few years has played an vital role in the reoccurrence of the NiV virus in the India. Health and natural science experts are trying to creak the puzzle of reoccurrence after the 2001and 2007 in indin by the time infection has been claimed over 10 live with in short period of time. A.C. Dhariwal, adviser, national vector borne disease control programme has given an statement regarding the NiV virus "We are looking at the causes of the re-emergence of the virus. Specialized team at our strong network of laboratories are trying to find out the causes of outbreak, India is witnessing a rapid urbanization and animals and birds including bats are losing their natural habitats. In recent years, humans are animals are coming in contact with each other which is also causing outbreak of diseases such as Nipah," he said. Juliet Pulliam, director for South African DST-NRF Centre of Excellence in Epidemiological Modelling and Analysis (SACEMA) at Stellenbosch University, warned the virus is more easily spread from people with respiratory symptoms. She said: "Nipah virus can be transmitted from person to person, but this transmission is not very efficient. When transmission does occur, it is usually to close contacts who have been exposed to the bodily fluids of a person who is sick. People with Nipah virus are more likely to transmit the virus if they have respiratory symptoms, such as difficulty breathing."

Diagnosis for NiV virus

Screening for the subjects with the NiV can be made during the initial and convalescent phases of the disease by using a combination of tests. Real time polymerase chain reaction (RT-PCR) from cerebrospinal fluid, nasal swabs, urine, and blood should be performed in the primary stages of

disease. Later antibody detection by ELISA (IgG and IgM) can be performed. In serious cases immunohistochemistry test on the tissues collected while autopsy will be only way to validate the diagnosis of the disease. [10]

Treatment for NiV virus

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.

Antiviral treatment is considered as the one of the best option but there is no licences for in treating the henipaviruses but few studies has been suggested this therapy as best in the animal model. One of the anti-viral drug ribavirin is considered as a first line treatment for assumed viral infections of unknown origin, it exhibits best action towards the virus containing DNA and or RNA agents in them and is an accepted or approved treatment for several viral infections including respiratory syncytial virus and viral hemorrhagic-fevers. In vitro studies have shown that ribavirin is effective against both Hendra and Nipah virus replication. Along with this chloroquine anti-malaria drug is considered to stop the critical proteolytic processing which is essential for the maturation of the virus but recent animal studies has proved that the anti-viral drug ribavirin treatment is not as the best treatment for the curing of the disease but this drug only delayed effect of the disease. Few researches has been done on the m102.4 mAb agent for the Hendra and Nipah virus in animals it has given the positive results [8, 9]. By seeing the Impact of the disease in the society, Australian health authorities' has obtain m102.4 as a possible consideration for the use of therapeutic option for the disease condition even though clinical trials data in human has not been obtained and safety data of the mAb in humans was not clear. As the research regarding the m102.4 agent has been done extensively in the 21 century Queensland Government, Queensland Health, to allow health authorities to manufacture m102.4 for its potential use on a compassionate basis in future cases of high-risk human exposure [9]. Later this drug has been administered to an individual but no side effects or adverse drug effect has been found for that individual.

Vaccination status of NiV virus

Currently there is no particular vaccine for the NiV virus but all the research and development activities of the NiV vaccines are in the pre-clinical stage having been tried in the hamster, ferrets. The most advanced vaccine Equivac HeV® that is formulated with a proprietary immune stimulatory complex adjuvant and some other cross immune protective agents has been developed but the exact activity and the effect on the NiV virus is not so clear. So in order to control the current condition in India scientist around the globe are rushing their research to find the vaccination for the virus.

CONCLUSION

M102.4 is not a vaccine for NiV virus but it is a human Monoclonal Antibody (M 102.4) it is drug, developed by Dr Christopher C Broder from Australia even, name for this is not given because it is still in clinical trials. Effect of the m102.4 is found in the in vitro. In order to control the current situation in India main cell line by how the mab was prepared should be studied and understand in detail by the ICMR and other research organizations. If this happens then India can also produce the antibiotics for Niv virus.

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