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Dentistry

Nipah infection- Dentists Perspective

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Review Article

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Abstract: Nipah virus infection is a newly emerged zoonosis (disease transmitted to humans from animals) affecting the south-east Asia. As dentists are one of the health care professionals who work very closely with patients, this article reviews the spread of Nipah infection and precautions to be taken by the Dental Surgeons.
Keywords: Nipah virus, Zoonosis, Henipa virus.

INTRODUCTION

Zoonotic infections accounts for more than 60% of the newly identified infectious agents that have affected people over the past few decades [1]. Nipah virus, one of the members of Henipa virus family is an emerging zoonotic virus that can cause severe and lethal respiratory illness and encephalitis in humans. Recent endemic threat of Nipah viral outbreak has been reported in Kerala, India in May 2018 [2].

Majority of these zoonotic infections originates from the wildlife. Emerging infectious diseases in wildlife threaten global biodiversity and public health. Bats are natural hosts to a variety of potentially zoonotic pathogens, including Ebola, Marburg, SARS and Melaka, new Middle East Respiratory Syndrome (MERS),coronavirus, Hendra viruse and a recently identified Influenza A virus. This list also includes Nipah virus, which was first identified in Sungai Nipah village of Perak in Malaysia in 1998, with continuing, periodic outbreaks in Bangladesh and India. Nipah was initially thought to be a form of Japanese encephalitis and later found out to be one of the most deadly viruses known to infect humans with a mortality rate of 40-100% [1, 3, 4].

TRANSMISSION

Based on the animal surveys Pteropus bats, which comprise most of the fruit bat species are appear to be the reservoir hosts of Nipah virus. Infected bats shed the virus through the urinary route and can infect humans through involvement of intermediate amplification hosts such as horses and pig's. Trading of infected pigs and the long distance migration of Pteropus bats may have been responsible for NiV spread. Person to person transmission is believed to be through contact with respiratory secretions or aerosols, as the virus can be isolated from throat swabs [3, 4].

While the outbreak in Malaysia had followed spill over transmission from fruit bats to amplification host (livestock) and finally to humans, During the later outbreaks in Bangladesh and India, Nipah virus spread followed a stuttering mode of transmission through close contact with people's secretions and excretions. In Siliguri, India, transmission of the virus was also reported within a health-care setting, where 75% of cases occurred among hospital staff or visitors [1, 3, 4]

Signs and symptoms

Based on the time interval between last exposure to subsequent onset of illness, the incubation period ranged from 4 days to 2 weeks but may be extended upto 45-60 days. Although some Nipah virus infections can be asymptomatic or mild, most of the cases reported have been characterized by respiratory disease and/or acute neurological signs. It usually begins with fever, headache, sore throat and myalgia and a nonproductive cough may also be seen. This may be followed by encephalitis, with symptoms such as Nausea, vomiting drowsiness, disorientation, signs of brainstem dysfunction, convulsions, coma, segmental myoclonus, and other signs [5]. Confirmed NiV patients showed marked vasculitis with endothelial damage, up to cellular lyses, in the arterioles, venules, and capillaries of various organs. The brain was the most severely affected organ. Other affected organs were the kidney, lung, and heart. Septicemia, bleeding from the gastrointestinal tract, renal impairment and other complications are possible in severely ill patients. In the lung, vasculitis was seen in 62% of cases and fibrinoid necrosis was found in 59% of cases [5, 6].

DIAGNOSIS

Nipah virus infection can be diagnosed by virus isolation,serology and RT –PCR. Since Nipah is classified as a biosafety level 4 (BSL4) agent, special precautions must be undertaken in the collection, submission and processing of samples. Biosafety considerations require that this work be carried out only in a physical containment level 4 (PC4) facilities. Various strategies have been developed to reduce the risk of laboratory sera, including gamma-irradiation or sera dilution and heat-inactivation. In humans, this virus has been isolated from blood, throat or nasal swabs, cerebrospinal fluid and urine samples, as well as from a variety of postmortem tissues. Immuno histo chemistry can be used to detect viral antigens in dead patients. Serological tests used in humans include ELISAs to detect henipavirus-specific IgM or IgG in serum and/or CSF, and serum neutralization. IgM can be found in a significant number of patients during the illness. A rising titer, using acute and convalescent sera, is also diagnostic [1, 4-6].

PREVENTION AND TREATMENT

There are currently no antiviral drugs or vaccines available to treat Nipah virus infection for either people or animals. Intensive supportive care with treatment of symptoms is the main approach to managing the infection in people. Ribavirin appeared to be promising in some outbreaks, but had little or no effect on the outcome in animal models, and its efficacy is currently considered to be uncertain [7].

Close contact with fruit bats and their secretions and excretions should also be avoided. Fruit should be washed thoroughly, peeled or cooked before eating. Patients should be isolated, and personal protective equipment such as protective clothing, gloves and masks should be used. Good personal hygiene, including hand washing, is likely to reduce the risk of infection from the environment [5-7].

Precautions to be taken by the dental surgoens

Dentists are one of the health care professionals who work very closely with patients. In dental operatory aerosols containing microbes from the oral cavity of the patient are created when using modern high-speed rotating instruments in restorative dentistry. Most procedures performed by the dental team have the potential for creating contaminated aerosols and splatter. Bacterial diseases, viral infections and other skin infections are caused by the microorganisms which were isolated in dental aerosols [8]. Eventhough no case of Nipah spread through dental aerosols or through human spread are reported, universal precautions has to be taken by dental professionals and auxillaries for self protection and spread of infections during the outbreaks in the nearby areas.

Like any other health care professional, dentists has to inform the public with facts about the Nipah viral infection and try to reassure them. Inform them that infection is spreading through the close contact and infected body fluids, and the good hygiene and sanitation are important.

When in doubt perform only the emergency treatment is to be carried out and delay elective procedures to another date. Restrict the number of people entering to the operating room. The hand hygiene measures have to be performed thoroughly and frequently. Dentists should avoid touching eyes, ears and mouth before performing the hand hygiene measures.

As a healthcare professional dentists not only to prevent the transmission of infection but also not to get infected. While performing the procedures try to minimize the contact with the operating field and follow the proper gloving techniques. Always follow the proper use of barrier techniques and disposal of the used barrier material. Try to avoid the close contact with the patients and use triple layered mask or N95 masks for the dentists and the assistants during the time of outbreak.

Routine hand washing with commercially available medicaments has to be done before putting on a mask. Avoid touching the mask after wearing and properly dispose it. Change the surgical masks frequently. Protective eye wears should also use while doing any procedure to avoid aerosol contamination [9].

CONCLUSION

There is only limited knowledge about spread of Nipah infection Health-care workers caring for patients with suspected or confirmed infection, or handling specimens from them, should implement standard infection control precautions at all times

As human-to-human transmission has been reported, in particular in health-care settings, contact and droplet precautions should be used in addition to standard precautions.

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