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Editorial

Recent Nipah virus outbreak in India: lessons and imperatives

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Dear Editor,

While the COVID-19 pandemic has consumed our collective focus, another viral threat has resurfaced, reminding us of the importance of vigilance in the face of emerging infectious diseases. Kerala, a southern state in India, is again at the forefront of a public health crisis, battling the rare and deadly Nipah virus (NiV) outbreak. With two reported fatalities and several individuals currently hospitalized, we must delve into the underlying causes to contain this outbreak. NiV infection, a newly emerging and highly lethal zoonotic disease, substantially threatens human health with significant mortality rates of about 40–75%. It is a zoonotic pathogen of the Paramyxoviridae family's *Henipavirus* genus and has emerged as a paramount public health concern. The fruit bat (genus *Pteropus*), commonly called the flying fox, is the primary reservoir for this zoonotic virus. Since its first identification in Malaysia in 1998, NiV has posed a formidable threat, causing a spectrum of mild to life-threatening diseases in humans and animals.[1]

Healthcare workers have tested more than 700 people for infection over the past week. State authorities have closed some schools, offices, and public transport networks. Kerala has experienced four Nipah outbreaks in the past 5 years, with the most recent one occurring in 2021. While such outbreaks typically affect a relatively small geographical area, they can be deadly. Some scientists express concern that increased human-to-human transmission could make the virus more contagious. Rajib Ausraful Islam, a veterinary physician specializing in bat-borne pathogens at the International Centre for Diarrhoeal Disease Research, Bangladesh, in Dhaka, states that NiV has a fatality rate ranging from 40% to 75%, depending on the strain. 'Each outbreak is a concern', he says, 'Every outbreak provides the pathogen with an opportunity to modify itself'. The virus can cause fever, vomiting, respiratory issues, and inflammation in the brain. It is primarily carried by fruit bats but can also infect domestic animals like pigs and humans.[2]

Recent news reports have highlighted the resurgence of this deadly virus in Kozhikode, a district in Kerala that has been the prime location of this disease in the past. To date, six confirmed cases have been reported, of which two have died. Both fatalities were male patients aged 49 and 40 years, respectively. Further samples of 30 persons, including 15 healthcare workers of the same private hospital where the index case was detected, were sent to NIV Pune (National Institute of Virology), where they tested negative. Also, contacts of the index cases from other districts have been traced, and the results of these tests are pending. We must stay vigilant and prepared for any potential escalation in the number of cases (Table 1).[3]

Epidemiological studies across NiV outbreaks in Malaysia, Singapore, Bangladesh, the Philippines, and India reveal critical factors in human transmission of this relentless zoonotic infection.[8] Person-to-person transmission was not experimentally confirmed in Malaysia and Singapore, but strong evidence suggests its occurrence in Bangladesh

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Table 1. Current cases of Nipah virus in Kozhikode, Kerala, India.

S. no.	Parameter	Case 1	Case 2	References
1.	Date of death	30 August 2023	11 September 2023	2,4–7
2.	Location	Kozhikode, Kerala, India	Kozhikode, Kerala, India	
3.	Sex	Male	Male	
4.	Age	49 years	40 years	
5.	Possible incubation period	4–14 days	4–14 days	
6.	Transmission route	Direct contact, consumption of food, respiratory, person-to-person, and animal-to-human	Direct contact, consumption of food, respiratory, person-to-person, animal-to-human	
7.	Symptoms	Fever, vomiting, respiratory issues, and inflammation in the brain	Fever, vomiting, respiratory issues, and inflammation in the brain	
8.	Cause of death	Nipah virus infection	Nipah virus infection	

and India, highlighting varied transmission pathways within NiV outbreaks.[8]

Clinical symptoms of NiV infection vary widely, encompassing asymptomatic cases, encephalitic syndromes marked by fever, neurological signs like altered mental status, and respiratory symptoms like cough and dyspnea. Fever, accompanied by headache in most patients, is universal.[1] Differences in symptom prevalence and severity between outbreaks, particularly respiratory symptoms, may be linked to human-to-human transmission dynamics, as observed more prominently in Bangladesh outbreaks. One significant factor contributing to the increased incidence of Nipah outbreaks in Kerala is the rapid urbanization and environmental changes occurring in the region. As urban areas expand, natural habitats are disrupted, leading bats to migrate closer to human settlements. Moreover, the NiV outbreak in Kerala serves as a poignant reminder of the need for proactive measures to address the complex challenges of zoonotic diseases.

The virus detected in Kerala was the same strain previously found in Bangladesh. The occurrence of cases of the new COVID-19 variant, Eris, in India is a clear reminder that the threat of emerging infectious diseases remains ever-present.[9]

Preventing NiV infection involves avoiding contact with infected hosts (fruit bats and pigs) and their secretions and contaminated food. Careful examination and thorough washing of fruits from bat-inhabited trees are essential precautions. NiV transmission can occur through respiratory droplets or contact, necessitating proper care for infected individuals, including frequent handwashing, sanitization with 70% ethanol, and avoiding direct contact with bodily fluids. Surveillance for NiV in humans and reservoir animals in affected areas is critical for early outbreak detection. Developing specific antiviral agents is imperative, given NiV's high mortality and impact on community health.

Treatment options for NiV remain limited, with supportive care as the only available approach due to the absence of specific antivirals or vaccines. Past outbreaks have seen the use of ribavirin and acyclovir, showing varying effectiveness rates. Ribavirin, administered orally or intravenously during the Malaysian outbreak, reduced mortality rates by up to 36%. Acyclovir was employed in the Singapore outbreak, with one reported death due to NiV infection, but its efficacy remains unclear.[10] Recent studies on antiviral favipiravir (T-705) in NiV-infected hamsters have shown promise, as have vaccine studies in hamster models. Given NiV's severe impact on

community health, developing specific antiviral agents is crucial for early treatment.

Strengthening infection control practices, ensuring medical supplies, and training hospital staff are essential for managing future outbreaks.[11,12] Transitioning to electronic health reporting and maintaining universal precautions in healthcare settings are critical for effective response. Only through a concerted global effort can we hope to prevent future outbreaks and protect the health of our communities.

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Consent for publication
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