Popular Article

West Nile Fever: A Global Perspective

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Introduction

West Nile Fever (WNF) is a noteworthy zoonotic disease influencing public health and veterinary medicine to a considerable extent, caused by the West Nile virus of the Flavivirus genus and belongs to the Japanese encephalitis antigenic complex of the family Flaviviridae. Reported first time isolated in Uganda in 1937, commonly found in Africa, Europe, the Middle East, North America and West Asia. Since then many sporadic emergences have been reported globally, WNF has earned attention for its potential to cause outbreaks and severe neurological complications in humans, highlighting the importance of understanding its epidemiology, transmission dynamics, and impact on human and animal populations. The onset of this mosquito-borne disease is characterized by a multifaceted transmission process in which the birds act as reservoir hosts and mosquitoes as vectors (Culex pipens, Culex vishnui, Culex quinquefasciatus). WNV being a neurotropic ss RNA virus can cause deadly neurological signs in humans. Incidental hosts include humans and other mammals.

Vectors that can transmit infectious pathogens between animals to humans and vice versa involve bloodsucking insects mainly mosquitoes, which ingest disease-producing pathogens in the course of a blood meal from a diseased host and later transmit it into a new host, after the causative agent has replicated. In India, where the burden of mosquito-borne diseases is considerable, WNV represents a growing public health challenge, with sporadic outbreaks and cases reported across various states. Recognizing the zoonotic significance of WNF is essential for implementing effective surveillance, prevention, and control measures to mitigate its impact on human and animal health both globally and within India's borders.

Emergence in India

Kerala is one of the sporadically active places in emerging and re-emerging diseases in India. WNF reported back in 2011 that in 2019, a 6-year-old boy from Malappuram district died from the disease. In 2022, a 47-year-old man from Thrissur district also died from this disease. Now in 2024, on May 7th, 10 such people tested positive for WNF from 3 districts of Kerala.

Risk Groups

Severe illness can occur in people of any age, however:

- People over 60 years of age are at greater risk for severe illness if they are infected (1 in 50 people).
- People with certain medical conditions, such as cancer, diabetes, hypertension, and kidney disease are more susceptible.
- People who have received organ transplants are also at greater risk.
- The incubation period ranges from 2 to 14 days but may be up to 21 days for the immunocompromised patients.

Symptoms and clinical signs

- Headache, and muscle aches.
- Swollen lymph nodes.
- High fever.
- Dizziness, and nausea.
- Skin rashes, and memory loss.
- Severe forms of disease manifestations are disorientation, coma, tremors, stupor, convulsions, and paralysis.

Diagnosis

- Signs and symptoms.
- History of possible exposure to mosquitoes.
- Viral loads are detectable in plasma for 2 to 18 days post-infection.
- Sample matrix types tested include whole blood, serum, urine and CSF (in cases with neurological manifestations) and urine after 5 days post onset of symptoms.
- It has been reported that whole blood is the most sensitive sample type.

Preventive measures

- Intensified pre-monsoon cleaning and destruction of mosquito breeding grounds.
- Enhanced surveillance of mosquito population, collection and testing of mosquito samples and public awareness campaigns.
- Preventative measures for WNV include public education on mosquito bite avoidance in endemic areas. Surveillance and control of invasive mosquito vectors also remain effective.

Medication

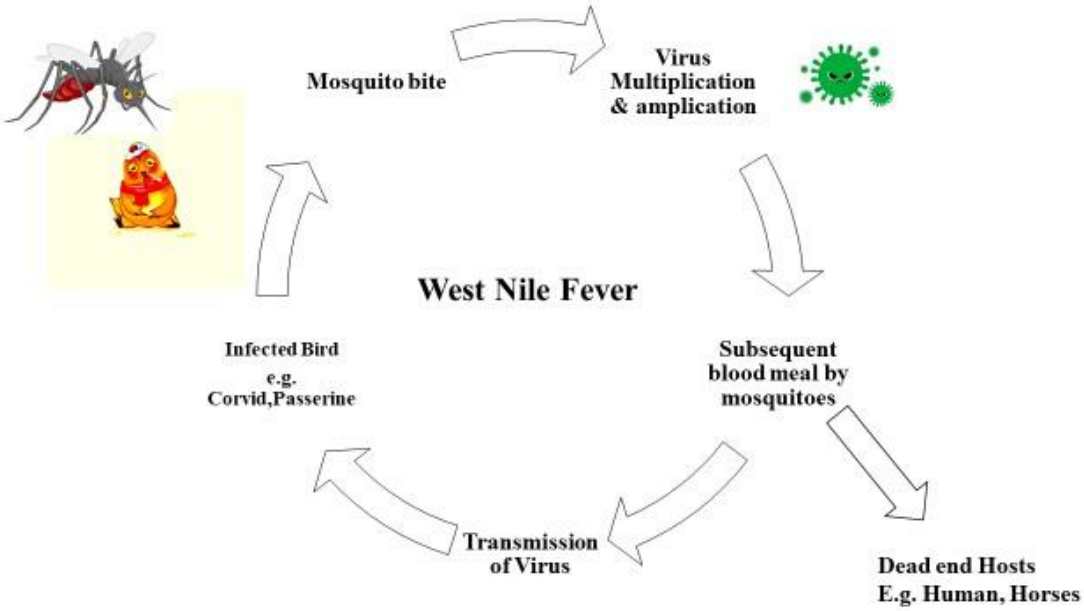
As such there are no vaccines or specific antiviral treatments for West Nile Fever Virus infections, for patients with neuro-invasive WNV disease like encephalitis, meningitis, or meningoencephalitis.

Supportive Therapy

- *Pain and fever management*: Use of antipyretics and analgesics.
- *Hydration*: Intravenous fluids, and oral rehydration.
- *Hospitalization for severe cases*: Monitoring and Support for patients with severe symptoms, such as encephalitis or meningitis, may require hospitalization for close monitoring and supportive care. Respiratory Support through mechanical ventilation may be necessary for patients with respiratory distress.
- *Neurological care*: Anticonvulsant medications may be used for patients experiencing seizures. Physical Therapy for patients with muscle weakness or

paralysis, physical therapy can help in recovery and rehabilitation.

- *Prevention from secondary infections*: Antibiotics to treat secondary bacterial infections can be



Transmission cycle of West Nile Fever