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Commentary

Leading Cause of Mosquito Borne Disease: West Nile Fever

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DESCRIPTION

The West Nile (WN) virus is an avian, equine, and human flavivirus that is spread by mosquitoes. The virus is native to Africa, Asia, Europe, and Australia. Recently, it has produced significant epidemics in Israel, Romania, and Russia. The WN virus is maintained in nature *via* a mosquito-bird-mosquito transmission cycle that predominately involves *Culex* sp. mosquitoes, with birds serving as the natural reservoir (amplifying) hosts. The WN virus was very recently discovered in North America after being discovered there in 1999 during a meningoencephalitis pandemic in New York City. The virus expanded its geographic reach throughout a large portion of the eastern United States between 1999 and 2002, and it is anticipated that it will continue to do so in the western hemisphere.

The majority of WN virus infections in people are subclinical, however clinical infections can range in severity from simple WN fever to lethal meningoencephalitis; the risk of developing severe neuroinvasive disease and passing away rises with age. The cornerstone of laboratory diagnosis is still serology. There is no known medication or vaccination that targets the WN virus. Public awareness campaigns and organized, long-term vector mosquito management are essential to prevention.

Arthropod-borne viruses have demonstrated an increasing capacity to travel outside of the regions that were previously thought to be their established geographic ranges in recent years. This process is being driven by a variety of variables, such as bird migration, an increase in global trade, and the movement of vector species. The welfare of people and livestock is in danger due to this range extension. Bluetongue virus and Schmallenberg virus, which most recently originated in Europe and is dangerous for livestock, are examples of such viruses. Such disease outbreaks have a negative impact on animal health and the cattle business. The recurring appearance of West Nile Virus (WNV) in Europe is one such example of one such range expansion. Other developing viruses are zoonotic. Rapid pathogen testing and host-specific serological assays are essential Brief Note on Natural and Synthetic Microbial Medicine.

West Nile virus belongs to the family *Flaviviridae* and is related to Japanese encephalitis virus both phylogenetically and antigenically. In the West Nile district of Uganda, the virus was originally discovered in the blood of a woman who was ill with a feverish illness. The fact that this first isolate is now thought to be a member of lineage 2 suggests that it had early zoonotic potential. In later research, WNV was isolated from human sera in Egypt as well as from birds and mosquitoes. This proved that mosquitoes were the virus' most likely carrier, and that the virus was kept in an endemic cycle by blood-feeding on birds. Early phylogenetic analyses, which are covered in more detail in the parts that follow, showed that there are two main lineages, both of which are found in Africa.

The expansion of WNV throughout the western hemisphere, its appearance in North America, and recurrent outbreaks in Europe show that WNV has the broadest circulation of any arthropod-borne virus. WNV is widespread and endemic throughout Africa. Although there have only been a few isolated human instances, environmental factors that encourage mosquitoes, such as high daytime temperatures or frequent rainfall, have caused widespread outbreaks. Tens of thousands of human infections occurred during one such incident in the Karoo region of South Africa in 1974.

Serology tests on horses and birds have shown that southern Africa has a high seroprevalence of WNV infection. WNV outbreaks in the late summer have become a yearly occurrence in Mediterranean Sea-adjacent European nations, and the virus is now regarded as endemic in some areas. The majority of outbreaks have been classified as belonging to WNV lineage 1, and they were connected to those in Israel and North America. Additional victims of this lineage include humans, horses, and bird species. There are surprisingly few neurological disease cases reported in Africa, where lineage 2 predominates, whereas there have been many human and equine cases reported in North America and Europe. This suggests that lineage 1 strains have increased pathogenicity, whereas lineage 2 strains have low pathogenicity.

However, case reports and experimental research in mice have

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have shown that both WNV lineages can produce zoonotic disease, including potentially lethal neuroinvasive disease. This has been fully understood as a result of numerous West Nile fever outbreaks in Greece since 2010, which were brought on by WNV lineage 2 and resulted in hundreds of instances of West Nile Neurological Diseases in humans (WNND).

Within the next few years, the West Nile virus is projected to spread throughout the western United States, following the local and regional flyway patterns of viremic birds. A crucial link in identifying novel and unexpected disease activity is provided by doctors. There is a lack of information on the long-term effects of West Nile virus infection, the level of transmission risk associated with blood and organ transfusions, prospective therapeutic measures, and vaccine possibilities. The expertise of doctors who diagnose, treat, and report cases of West Nile virus infection may significantly advance understanding of this newly emerging infectious disease.