

Editorial

West Nile virus infection in Brazil

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The West Nile virus (WNV) is an arbovirus of the *Flavivirus* genus (*Flaviviridae*) that occurs in Africa and in the Mediterranean basin, infects birds, and is transmitted by *Culicidae* mosquitoes. In the last 20 years, after an unexpected introduction into the American continent, WNV rapidly became an important public health problem, particularly in North America where it has caused infections of the central nervous system in thousands of humans, with many deaths. Introduced into North America in 1998, probably by an infected and viremic passenger coming from Israel, WNV arrived in the City of New York¹. It is surprising how rapidly WNV adapted to a cycle involving American mosquitoes and birds. By doing so, the virus caused an epizootic that killed many birds, affected humans and horses, and spread all around North America within a few years.

The epizootic among birds caused by WNV also spread southward reaching the Caribbean and Central and South America where it also infected horses. These animals were found with antibodies to WNV in Colombia and the virus was isolated from a horse in Argentina in 2006^{2,3}. In Brazil, neutralizing antibodies to WNV were reported in horses from the Pantanal and the Northeast regions of Brazil⁴. However, only in 2014, the first case of WNV encephalitis was reported in the Northeast region, State of Piauí⁵. The infected patient had encephalitis with flaccid paralysis and survived. Animal reservoirs and vectors of WNV related to this human case remain unknown. Finally, the virus was isolated last year from a horse in Espírito Santo State, southeast of Brazil⁶. Thus, despite evidence of WNV circulating in Brazil for at least 8 years, only one human case has been reported.

Why do we not have human WNV outbreaks in Brazil? The circulation of many flaviviruses in the country could explain this phenomenon. Brazil has some endemic American flaviviruses such as Saint Louis encephalitis virus, Cacipacore, Ilhéus, and Bussuquara viruses that cause sporadic

human cases, and even Rocio virus that cause outbreaks⁷. Saint Louis encephalitis, Cacipacore, and Rocio virus are phylogenetically closely related to WNV, infect birds, and are transmitted by *Culicidae* mosquitoes. In Brazil, some imported flaviviruses also became serious public health problems: dengue viruses 1–4, Zika virus, and yellow fever virus, all transmitted by *Aedes aegypti* and causing large outbreaks in the last five years⁸. Finally, we have the attenuated virus vaccine to yellow fever that has been extensively used to immunize most of the Brazilian population. Therefore, it is possible that infections caused by other flaviviruses could induce some level of cross-protection to infections or disease caused by WNV. This cross-protection could prevent more cases of encephalitis and outbreaks due to WNV. Another possible explanation could be related to genomic mutations leading to a lower virulence of the South American WNV. However, it has not been confirmed by a phylogenetic analysis of the Brazilian strain of WNV. The virus was more closely related to two strains isolated from birds, *Corvus brachyrhynchos* in 2002 and *Pelecanus erythrorhynchos* in 2005, both from the United States. A 99.0% (nucleotide) and 99.6% (amino acid) identity was observed between the Brazilian WNV and North American isolates⁶.

Despite the supposed apparent protection induced by antibodies of other flaviviruses or differences among viruses, it is important to consider WNV as a serious threat to human and veterinarian public health in Brazil. It is also important to remember that there is no human vaccine or antiviral drug routinely used for the treatment of WNV disease. Besides, mutations or introduction of more virulent WNV strains in Brazil could lead to outbreaks involving this virus. It is also important to consider that eventual outbreaks of WNV infection in human populations of remote areas of the country may not be detected by the public health system. Therefore, surveillance of WNV must be implemented based on monitoring and diagnosis of viral infections of the central nervous system, and also promoting virus detection or determining the levels of antibodies to the virus in humans, horses, and birds. You can find in this edition of the RSBMT an interesting review on *West Nile virus infection in Brazil. West Nile virus infections are here! Are we prepared to face another Flavivirus epidemic?*

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Received 3 May 2019

Accepted 9 May 2019

Conflict of interest

The author declares that there is no conflict of interest.

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