# West Nile Virus

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## Introduction

The virus appeared for the first time in the US in 1999 and spreads when a mosquitoes bites and the infected person, and then bite a healthy person. The west Nile virus has spread dramatically in the US every since. The virus belongs to the flavi virus group, and reaches its peak in the early fall, and decreases as the weather becomes cooler, resulting in fewer cases. The very young individuals or old aged are the persons most susceptible to developing a fully fledged disease, through the viral infection (West Nile virus, 2014). Since then it has become one of the most emergent diseases within the past decade.

## Discussion

The United States has also been a part of the new countries where this virus has emerged. Although this virus does not have a high mortality rate, when the virus surfaced it caused huge pandemonium, and fear around the country. People who are most vulnerable are the ones who have undergone chemotherapy, are under prolonged use of immunosuppressive medications, or have an immune-compromised state like HIV patients. Women who are pregnant are highly susceptible to develop the viral infection. The virus can be transmitted to through organ transplant, blood transfusion, and can also be transferred through an infected mother breast feeding her child.

**History of the Disease**

The virus West Nile is a Flavivirus (which includes the virus of yellow fever, Saint-Louis encephalitis virus and the Japanese encephalitis virus). Its name comes from the West Nile district of Uganda, where it was identified for the first time in 1937 in a woman who was suffering from a particularly high fever. The virus was later found in men, in birds and mosquitoes in Egypt in the fifties, eventually spreading to other countries. The disease has an epidemic trend and is particularly widespread in Africa, Middle East , India , Europe and, more recently, in the United States , where the first outbreak was declared in New York in 1999. Affecting both horses and people, 15,000 cases were reported only in horses. At present, the West Nile virus is an annual threat for horses and for people in the United States, where the disease has become endemic. The impact on horses and horse breeding in American industry has been devastating, with a mortality rate of approximately 40%. There have been reports of infection in 77 horses and two people in the United States.

**Causative Agent**

The virus has global effects, as after infection waves in 1996 in Bucharest and Russia in 1999, each with several hundred patients, after 20 cases of severe illness in Hungary in 2008 and the identification of the virus in birds in Austria last year, is now growing concern that the virus further into Europe spreads (West Nile virus, 2014). Just the experience from the U.S. suggests the importance of local conditions just seem to be with the birds that a so-called pathogen reservoir for the proliferation of viruses presents. In North America, the virus could spread at a phenomenal rate.

Only in 1999 the West Nile virus in New York was identified after the Central Park birds were dead from the fallen trees (Powell, 2011). Seven deaths reported by the authorities soon after. As the most practical step to avoid the virus, is through prevention, an excessive amount of pesticides are in the environment to reduce the mosquito population, both at individual and collective level. Then the number dropped to under 50 - probably because the Americans are now aware of the risks and are taking simple but effective counter measures against the carrier.

**Symptoms**

Common symptoms include fever, maculopapular or morbilliform rash, headache, muscle weakness, myalgias, anorexia, nausea, vomiting, and difficulty concentrating (Petersen, et al., 2003; Hayes, et al., 2005; Hayes & Gubler, 2006; Gyure, 2009). Recovery is often made in 3 to 6 days. However, 1 in 150 patients develop neuroinvasive disease such as meningitis, encephalitis, and acute flaccid paralysis/poliomyelitis (Davis, et al., 2006; Gyure, 2009), as well as a variety of other neurological abnormalities. Approximately 40% of such patients develop meningitis, while the other 60% develop encephalitis (Gyure, 2009). Approximately 40% to 70% of MRI imaging is abnormal, demonstrating CNS lesions in patients (Petropoulou, et al., 2005; Debiasi & Tyler, 2006; Gyure, 2009). Individuals with certain chronic health problems and advanced age are at higher risk for neuro-invasive disease and death.

**Transmission of WNV infection**

The primary route of WNV infection in humans and other mammals is through the bite of an infected mosquito. Mosquitoes become infected when they feed on infected birds. Birds are the primary reservoir of the virus. When infected, birds build up a high level of virus in their

blood and they can survive from 4-6 days after being infected, during which time they can pass the virus on to other birds and mosquitoes. Once a mosquito becomes infected, it can pass the virus on to humans or other animals when they next take a blood meal. Humans, horses, and other animals are secondary, "deadend" hosts. They do not develop high-level viremias and cannot pass the virus on to others.

WNV can also be transmitted through blood transfusions and organ donations. Since 2003, the Red Cross uses Nucleic Acid Testing (NAT) to screen all blood donors for WNV. In 2010, 117 blood donors tested positive for WNV across the United States (CDC, 2010). There have also been cases of WNV transmission from mother to child during both delivery and breast-feeding. These cases are rare, though pregnant women should take precautions to reduce their risk for WNV and other arboviral infections by avoiding mosquitoes. There have also been rare cases of accidental acquisition of WNV by laboratory workers while testing animals for WNV (Sampathkumar 2003).

**Complication/ Community Health Concern**

The health authority, for example, strongly recommends the use of anti-mosquito agents, water containers outdoors where mosquitoes can lay their eggs, should be covered or emptied regularly (West Nile virus, 2014). Education and information is the most important step against the virus. People cover septic tanks; secure screens to windows and vent pipes, and to wear long clothing and insect repellent while outdoors. Prevention is much more practical than trying to cure the infection as it spreads by mosquitoes; it is easier to prevent bites from them. The health authority, for example, strongly recommends the use of anti-mosquito agents, water containers outdoors where mosquitoes can lay their eggs, should be covered or emptied regularly.

**Treatment and Nursing Management**

Since the immune system can be effective in clearing the virus out of the body, treatment for the virus with immune cells has been a target for WNV treatment. Studies show that in vitro, when cells are pretreated with IFN-α/β, replication WMV is inhibited, but did not work as well after infection was established (Samuel and Diamond). Some studies also show that IFN-α/β along with the Hepatitis C viral drug ribarivin, can also provide some protection against the virus but no test on humans have been studied yet. These examples are just in vitro test in mice, but realistically, the only treatment for WNV has been supportive care.

These treatments aid the body in recovering from some of the complications that manifest as a result of infection. These treatments are, intravenous fluids given for dehydration, prevention of secondary infections, and in patients who have encephalopathy, muscle paralysis or Poliomyelitis-like flaccid paralysis, there may be the need for mechanical ventilation. The best treatment is always preventing strategies (West Nile virus, 2014). Since a preventative vaccine does not exist, the only ways for preventing are to protect by wearing insect repellent containing N,N-diethyl-m-toluamide (DEET), avoiding outdoor activity between dusk and dawn hours, were clothing that covers up areas of the skin, and to avoid contact with infected persons.

## Conclusion

In a nutsell, West Nile Virus has sparked an enormous amount of fear in the early 2000's. Based on the information in the paper, the virus really is not as potent as the public panic that it caused. The virus only tends to cause disease in older population, and being an enveloped virus, makes it very susceptible to many degrading conditions. When the disease disseminates, it is capable of causing paralysis, meningitis, encephalitis and long term neurological damage, but

that percentage of infected individuals is extremely low also. Prevention is much more practical than trying to cure the infection as it spreads by mosquitoes; it is easier to prevent bites from them. The health authority, for example, strongly recommends the use of anti-mosquito agents, water containers outdoors where mosquitoes can lay their eggs, should be covered or emptied regularly.

Furthermore, Just the experience from the U.S. suggests the importance of local conditions just seem to be with the birds that a so-called pathogen reservoir for the proliferation of viruses presents. In North America, the virus could spread at a phenomenal rate. Only in 1999 the West Nile virus in New York was identified after the Central Park birds were dead from the fallen trees. The fact it was a new virus being introduced to the country, caused an enormous amount of fear and panic, and this may have aided in actually keeping the virus in check, and keeping the virus from becoming a huge epidemic. December 2009, the CDC reported a decrease in the WNV activity in the U.S. (CDC).

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