

Position statement on West Nile virus: a committee opinion

Practice Committees of the American Society for Reproductive Medicine and Society for Assisted Reproductive Technology

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Although there is currently no definitive evidence linking West Nile virus (WNV) transmission with reproductive cells, it is recommended that practitioners defer gamete donors who have confirmed or suspected WNV infections. This document replaces the previously published document of the same name, last published in 2012 (Fertil Steril 2012;98:e15-6). (Fertil Steril® 2016; ■ : ■ - ■ . ©2016 by American Society for Reproductive Medicine.)

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West Nile virus (WNV) is a flavivirus still commonly found in Africa and the Middle East. It is closely related to the St. Louis encephalitis virus, which has appeared in previous limited epidemics in the United States. The primary mode of WNV transmission to humans is through infected mosquitoes (therefore, classified as an arbovirus). The normal transmission cycle for West Nile virus is from mosquito to bird and back to mosquito. The viral load in humans is too low to infect the mosquito and therefore human transmission is considered a termination point in the transmission cycle for West Nile virus (1).

There has been a significant increase in the number of reported cases of WNV infection in the United States over the past 2 decades (2). The first appearance of WNV in North America occurred in 1999, with encephalitis reported in humans and horses. According to the Centers for Disease Control and Prevention (CDC), there were 62 human cases reported from four states and six deaths occurred in 1999. In 2002, there were 4,156 human cases re-

ported from 44 states and the District of Columbia and 262 deaths occurred in 2002 (2). In 2003 the number of human cases reached 9,858 from 45 states and the District of Columbia with 264 deaths reported (2). In 2009 cases decreased dramatically with only 720 cases of WNV and 32 fatalities reported in the United States with the majority occurring in Colorado, California, and Texas (2). However, case numbers have increased significantly again with 5,674 total cases reported in 2012. Since then the numbers of cases per year have been consistent in the range of 2,200–2,500 (2).

Typically, approximately 80% of those infected with WNV remain asymptomatic. Approximately 20% develop "West Nile fever," which typically lasts only a few days and is characterized by a mild illness with flu-like symptoms. Approximately 1 in 150 individuals develops central nervous system (CNS) infection characterized by meningitis, encephalitis, or meningoencephalitis. Nationwide, mortality among those who develop meningoencephalitis is approximately 10%.

After initial infection, the virus accesses lymphoid tissues and becomes widely disseminated. Evidence of WNV has been noted in multiple non-neural tissues, including adrenal gland, heart, kidney, liver, and pancreas.

Between August 28 and October 2, 2002, 15 cases of WNV meningoencephalitis or meningitis having onset within 1 month after transfusion of blood products were diagnosed and reported to the CDC (3). Among these, the CDC determined that transmission via blood products was "highly likely" in several cases. On September 25, 2002, the CDC reported a case of possible transmission of WNV through organ transplantation (4). In this case, four organ recipients from a single donor all developed clinical WNV infection, and the donor's blood at time of organ harvest contained WNV sequences (5–7). On October 4, 2002, the CDC reported a case of possible transmission of WNV through breastfeeding (8). On December 20, 2002, the CDC reported a case of transplacental WNV transmission and fetal infection (9), and two cases of laboratory-acquired WNV infections attributed to percutaneous inoculation (10).

The Food and Drug Administration (FDA) has issued guidance to the blood industry, recommending that a potential blood donor with the medical diagnosis or symptoms

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suggestive of WNV be deferred until 14 days after the condition is resolved or 28 days from the onset of symptoms, whichever is later (3).

The FDA has cleared two tests to be used as screening tests for WNV (11, 12). The first test, IgM Capture ELISA, reportedly can correctly identify an antibody in up to 90%–99% of WNV disease cases. However, because antibody detection is not always specific, the test is considered presumptive and should be confirmed by further testing (11). Nucleic acid test (NAT) detects the genetic material of the virus and can identify early infection in the donor before antibodies are produced (12) and are recommended for WNV screening (3).

It is acknowledged that there are significant limitations with symptom screening for WNV. These include the high incidence of asymptomatic cases as well as the fact that symptoms typically follow the viremic period (the time period presumably most associated with transmission risks). An additional issue is that WNV infection in the United States has exhibited a seasonal pattern. It is not known (nor easily predicted from other flaviviral outbreaks) whether the number of reported WNV cases will continue to accelerate during the expected season (late summer through early fall) each year.

Despite the recent introduction of WNV screening tests, a number of factors, including test characteristics (sensitivity, specificity, positive predictive value, negative predictive value), anticipated clinical benefits, and costs, need to be carefully evaluated before any global recommendations for WNV testing in reproductive medicine can be offered.

SUMMARY AND CONCLUSIONS

- Although there is currently no definitive evidence linking WNV transmission with reproductive cells, it is recommended that practitioners defer gamete donors who have confirmed or suspected WNV infections until 14 days after the condition is resolved or 28 days from the onset of symptoms, whichever is later.
- Good donor practice would suggest that donors who are not in good health, including those with recent significant fever and flu-like illnesses, as well as those with recent viral meningitis, encephalitis, or meningoencephalitis episodes, be similarly deferred.

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and the Society for Assisted Reproductive Technology have approved this report.

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REFERENCES

1. Centers for Disease Control and Prevention. West Nile Virus. Available at: <http://www.cdc.gov/westnile/transmission/index.html>. Accessed December 18, 2015.
2. Centers for Disease Control and Prevention. West Nile virus statistics, surveillance, and control. Available at: <http://www.cdc.gov/westnile/index.html>. Accessed December 18, 2015.
3. Food and Drug Administration. Guidance for industry: Assessing donor suitability and blood and blood product safety in cases of known or suspected West Nile Virus infection. Available at: <http://www.fda.gov/biologicsbloodvaccines/guidancecomplianceregulatoryinformation/guidances/blood/ucm074111.htm>. Accessed December 18, 2015.
4. Centers for Disease Control and Prevention. West Nile virus infection in organ donor and transplant recipients—Georgia and Florida, 2002. *MMWR Morb Mortal Wkly Rep* 2002;51:790.
5. Iwamoto M, Jernigan DB, Guasch A, Trepka MJ, Blackmore CG, Hellinger WC, et al. Transmission of West Nile virus from an organ donor to four transplant recipients. *N Engl J Med* 2003;348:2196–203.
6. Centers for Disease Control and Prevention. Update: investigations of West Nile virus infections in recipients of organ transplantation and blood transfusion—Michigan, 2002. *MMWR Morb Mortal Wkly Rep* 2002;51:879.
7. Centers for Disease Control and Prevention. West Nile virus activity—United States, September 26–October 2, 2002, and investigations of West Nile virus infections in recipients of blood transfusion and organ transplantation. *MMWR Morb Mortal Wkly Rep* 2002;51:884–95.
8. Centers for Disease Control and Prevention. Possible West Nile virus transmission to an infant through breast-feeding—Michigan, 2002. *MMWR Morb Mortal Wkly Rep* 2002;51:877–8.
9. Centers for Disease Control and Prevention. Intrauterine West Nile virus infection—New York, 2002. *MMWR Morb Mortal Wkly Rep* 2002;51:1135–6.
10. Centers for Disease Control and Prevention. Laboratory-acquired West Nile virus infections—United States, 2002. *MMWR Morb Mortal Wkly Rep* 2002;51:1133–5.
11. Food and Drug Administration. FDA clears first test for West Nile Virus. Posted July 14, 2003. Available at: <http://www.rapidmicrobiology.com/news/697h0.php>. Accessed December 18, 2015.
12. Food and Drug Administration. FDA approves second West Nile Virus screening test for donated blood and organs. August 28, 2007. Available at: <http://www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/2007/ucm108974.htm>. Accessed December 18, 2015.