Position statement on West Nile virus: a committee opinion

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

American Society for Reproductive Medicine and the Society for Assisted Reproductive Technology, Birmingham, Alabama

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 2016 (Fertil Steril 2016;105:e9-10). (Fertil Steril® 2018;110:e1–3. ©2018 by American Society for Reproductive Medicine.)

Discuss: You can discuss this article with its authors and other readers at https://www.fertstertdialog.com/users/16110-fertility-and-sterility/posts/36353-26625

W est 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 reported from 44 states and the District of Columbia and 262 deaths occurred (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).

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 were diagnosed and reported to the CDC, having onset within 1 month after transfusion of blood products (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 the 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 symp-
toms 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). The nucleic acid test (NAT) detects the genetic
material of the virus, can identify early infection in the
donor before antibodies are produced (12), and is
recommended for WNV screening (3).

The FDA recommends the use of an FDA-licensed NAT to
reduce the risk of transmission from living donors. Because
>98.5% of WNV infections in each region of the United
States (50 states and the District of Columbia) occur between
June 1st and October 31st, the FDA recommends WNV testing
for oocyte and semen donors in the United States from June
1st through October 31st every year. In the case of a repeat
semen donor from whom a specimen has already been
collected and tested, and for whom retesting is required,
the FDA recommends collection of a specimen for WNV
NAT testing at the time of (or within 7 days before or after)
the first donation that is recovered within the June 1st
through October 31st testing period, even if an earlier spec-
imen was already collected and tested (13). Due to the
increased potential for donors to contract WNV infection
from June 1st through October 31st, the FDA suggests collect-
ing a semen specimen for WNV NAT testing at the time of (or
within 7 days before or after) each donation made during this
time period. Although this additional testing for subsequent
donations is not required, any reactive results must be
considered when making a determination of donor
eligibility.

Any oocyte or semen donor whose specimen tests nega-
tive (or nonreactive) for WNV NAT should be considered to
be negative (or nonreactive) for WNV for purposes of making
a determination of donor eligibility. Any oocyte or semen
donor whose specimen tests positive (or reactive) for WNV
in the preceding 120 days must be considered ineligible to
donate.

This recommendation for testing does not apply to cells
and tissues for autologous use such as reproductive cells or
tissue donated by a sexually intimate partner, or to cryopre-
served cells or tissue for reproductive use that were originally
exempt from the donor eligibility requirements. These recom-
mendations by the FDA should be implemented as soon as
feasible and should be considered recommendations and not
requirements.

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).

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

SUMMARY

- The FDA recommends WNV screening for oocyte and
  semen donors in the United States from June 1st through
  October 31st every year using NAT because >98.5% of
  WNV infections in each region of the United States (50
  states and the District of Columbia) occur between June
  1st and October 31st.
- Although there is currently no definitive evidence linking
  WNV transmission with reproductive cells, it is recommend-
ded that practitioners defer gamete donors who have
  confirmed or suspected WNV infections in the preceding
  120 days.

CONCLUSION

- Good donor practice would suggest that donors who are not
  in good health, including those with recent significant fe-
  ver and flu-like illnesses, as well as those with recent viral
  meningitis, encephalitis, or meningoencephalitis episodes,
  be similarly deferred.

Acknowledgments: This report was developed under the
direction of the Practice Committee of the American Society
for Reproductive Medicine as a service to its members and
other practicing clinicians. Although this document reflects
appropriate management of a problem encountered in the
practice of reproductive medicine, it is not intended to be
the only approved standard of practice or to dictate an exclu-
sive course of treatment. Other plans of management may be
appropriate, taking into account the needs of the individual
patient, available resources, and institutional or clinical prac-
tice limitations. The Practice Committee and the Board of Di-
rectors of the American Society for Reproductive Medicine
have approved this report.

This document was reviewed by ASRM members and
their input was considered in the preparation of the final
document. The Practice Committee acknowledges the spe-
cial contribution of Sangita Jindal, PhD and David Ball,
PhD in the preparation of this document. The following
members of the ASRM Practice Committee participated in
the development of this document. All Committee members
disclosed commercial and financial relationships with
manufacturers or distributors of goods or services used to
treat patients. Members of the Committee who were found
to have conflicts of interest based on the relationships dis-
closed did not participate in the discussion or development
of this document.

Alan Penzias, M.D.; Kristin Bendikson, M.D.; Tommaso
Falcone, M.D.; Susan Gitlin, Ph.D.; Clarisa Gracia, M.D.,
M.S.C.E.; Karl Hansen, M.D., Ph.D.; Sangita Jindal, Ph.D.;
Suleena Kalra, M.D., M.S.C.E.; Jennifer Mersereau, M.D.;
Randall Odem, M.D.; Robert Rebar, M.D.; Richard Reindollar, M.D.; Mitchell Rosen, M.D.; Jay Sandlow, M.D.; Peter Schlegel, M.D.; Dale Stovall, M.D.

REFERENCES


