

The Transfusion Saga Begins in Michigan

Fla. West Nile case may be unique

Mosquito exposure unlikely. Operation is possible cause.

By Brian Bandell
Associated Press

MIAMI — Health officials said Saturday they are investigating the possibility that a 63-year-old man contracted West Nile virus from a heart transplant or a blood transfusion.

It would be the first time such a method of transmission was recorded, according to the national Centers for Disease Control and Prevention. All cases of West Nile virus in the United States have come from contact with a mosquito, according to the CDC.

However, Florida health officials do not believe he could have been bitten by a mosquito because he has been hospitalized for some time.

"In the course of his daily activities, he wouldn't have come in contact with mosquitoes," said Mary Jo Trepka, epidemiology director of the Miami-Dade health department. "It's extremely unlikely he was bitten by a mosquito in Miami-Dade County. We're examining other possibilities."

The man has not left Miami-Dade County "for quite some time," she added. She wouldn't be more specific.

There have been no traces of West Nile in Miami-Dade County

year. A dead horse with the virus was found in the county in March 2001.

Nationally, at least 555 people in 26 states and the District of Columbia have been infected with West Nile this year, and at least 28, including three in Michigan, have died.

The patient, who was in critical condition Saturday, received a transplanted heart from a Georgia donor, said Jackson Memorial Hospital administrator Carlos Cruz. He wouldn't say when or where the operation occurred.

Georgia has had six confirmed cases of West Nile this year, and two of those patients died, the CDC said.

officials have placed 11 Florida counties on alert for West Nile, urging residents to take added precautions against mosquito bites.

About 1 percent of those infected with the virus show symptoms, with children and the elderly being the most susceptible. Deaths result about once in 1,000 infections, according to the CDC.

The only other confirmed case of West Nile in Florida this year was a 71-year-old resident of Sumter County who developed the virus this month. Sumter is in the central part of the state. Health officials believe that patient was infected in Louisiana.

In 2001, 12 Floridians con-

Despite West Nile fears, health officials say blood supply safe

LSJ-3-02
By KRISTEN WYATT
Associated Press

ATLANTA — Public health officials on Monday sought to assure Americans that the blood supply was safe despite concerns that an organ donor who received a transfusion may have transmitted the disease to four transplant recipients. One of the four died of brain

swelling that can be caused by the virus, which until now was blamed only on mosquito bites. The three others were hospitalized with symptoms associated with West Nile.

The organ donor, a Georgia woman, died in a car crash. She may already have been infected or may have gotten West Nile through blood transfusions in the emergency room after the

crash, the CDC said. Samples from the four transplant recipients were sent to the CDC's lab in Fort Collins, Colo. Test results are expected within the week. The organ recipient who died was in the Atlanta area. The others are at hospitals in the Atlanta area, in Miami and Jacksonville, Fla.

Public health officials assured people about the national

blood supply, despite the lack of a West Nile screening process in donated blood and organs. Any potential blood donor showing symptoms of the virus would be turned away, they said.

"The blood supply is as safe as it's ever been," Trudy Sullivan, an American Red Cross spokeswoman in Washington, said.

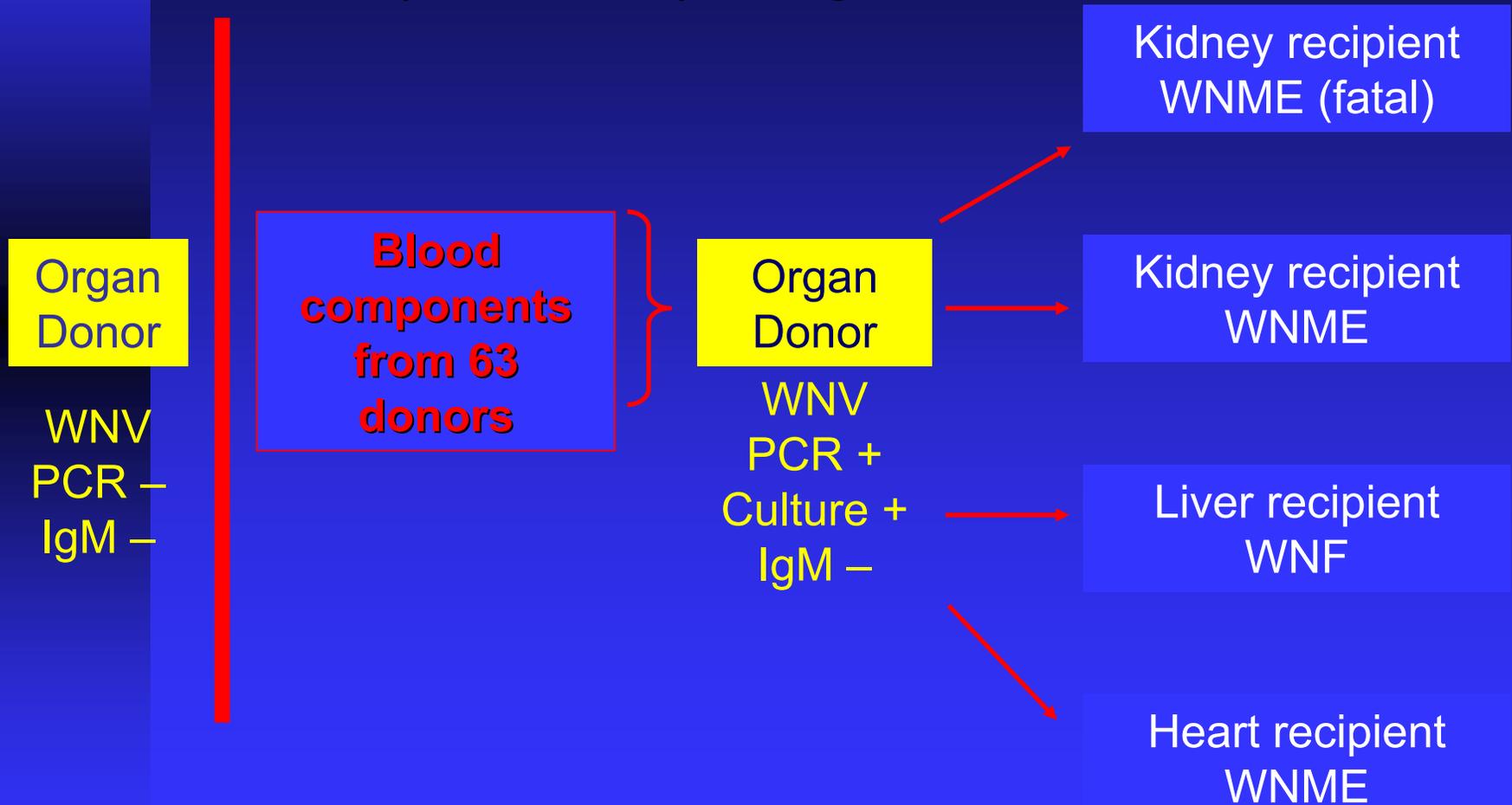
The Food and Drug Administration issued an alert to blood

banks two weeks ago to exercise caution in screening donors.

"We've known for some time that there is a theoretical possibility that people can get this through blood or organ transplants," said Tom Skinner, a Centers for Disease Control and Prevention spokesman.

So far this year, 638 people have tested positive for West Nile virus, and 31 have died.

West Nile Virus Infection in an Organ Donor and Four Transplant Recipients (GA & FL) August 2002



Transfusion-associated West Nile virus infection

Background

- Potential transmission
 - Transient viremia
 - Most infections asymptomatic
- “Small but not zero” risk
 - No chronic carriers
 - No cases reported in prior years or from endemic countries
- Estimated risk: 1.8-2.7/10,000 donations in 1999 Queens (NYC) epidemic

Investigation of transfusion-associated West Nile virus infection

- Comprehensive chart review of case
- Determine number & type of components transfused to recipient in 4 weeks before WNV illness onset
 - Retrieve “initial donation samples” (retention segments, untransfused product, NAAT tubes)
 - Test for WNV RNA (TaqMan rtPCR) and IgM antibody (ELISA)
- Donor F/U serum questionnaire & serum sample for WNV IgM antibody test
- F/U questionnaire & WNV IgM antibody testing of “other recipients” who received “suspect” blood product (if indicated)

Case definition: Confirmed transfusion-associated West Nile virus infection

- Probable/confirmed WNV illness* in blood product recipient
- Transfusion within 4 weeks of illness onset
- Evidence of viremia in donor:
 - TaqMan-positive* index donation sample(s)
AND virus isolation
 - OR**
 - TaqMan-positive* index donation sample(s)
AND seroconversion in donor

* CDC. Epidemic/Epizootic West Nile Virus in the United States: Revised Guidelines for Surveillance, Prevention, and Control, April 2001.

Transfusion investigations in MI

Case #	Age	# Donors	Underlying Condition	Outcome
1	47	39	Liver transplant	Alive
2	40	2	Obstetric	Alive
3	44	4	Organ donor	Fatal
4	12	83	Leukemia	Alive
5	72	10	CABG	Fatal
6	43		Stem Cell Transplant	Not WNV
7	51	79	Leukemia	Fatal
8	78	10	MI	Fatal

Transfusion investigations in MI, cont'd

Case #	Age	# Donors	Underlying Condition	Outcome
9	76	8	Cancer	Fatal
10	80	8	Dementia	Not WNV
11	26	17	Leukemia	Alive
12	69	-	Blood Donor	Alive
13	75	4	CABG	Alive
14	7	13	Cancer	Alive
15	73	21	Co-recipient	Alive

MI 0001

- 47 yr, male, Wayne county resident
- History of cirrhosis, hepatitis B, hepatocellular carcinoma
- Liver transplant 8/14/02
- Recovered, released 8/24/02

MI 0001 cont'd

- ER visit 9/3/02, Readmit 9/4/02
 - ◆ **FEVER, H/A, MENTAL STATUS CHANGE**
- CSF 9/5/02 WNV (+) IgM @ MDCH
- Recovered, discharged 9/13/02
- Received 39 blood components from 8/14/02 through 8/21/02

MI 0002

- 40 yr, female, Macomb county resident
- Normal delivery, 9/2/02; received 2 transfusions
- Discharged 9/4/02
- Readmitted 9/17/02: fever, headache, confusion/agitation

MI 0002 cont'd

- CSF 9/18/02 IgM (+) WNV @ MDCH
- Infant has been healthy throughout
- Traceback of blood revealed one component in common with liver recipient (MI 0001)

MI 0003: LIVER DONOR

- 44 yr, male, Wayne/Oakland resident
- 8/10 -12/02: intracerebral hemorrhage; Declared dead; Organs harvested.
- Autopsy 8/14/02
- Liver transplanted into MI resident 8/14/02
- Kidneys transplanted in MD resident 8/14/02

MI 0003 cont'd

DONOR LAB RESULTS

- Archived serum (@ time of harvest): IgM negative at CDC – Ft. Collins
- Kidney nephrectomized from recipient: IHC negative at CDC – Atlanta
- Autopsy tissues (inc. Brain, heart, lungs): IHC negative at CDC – Atlanta
- Thus, donor was **NOT INFECTED** with WNV.

MI 0001 & MI 0002

- Found to have one blood component in common
- Blood component in common found to be Taqman PCR positive @ CDC
- Donor of blood traced; Wayne county resident; reported symptoms 3 days post-donation
 - ◆ **Fever, rash, myalgia, minor weakness. Recovered 6-7 days later. Blood sample 10/7/02 IgM + at CDC.**

MI 0002 cont'd

■ Breast milk

- ◆ Sample collected 9/19: Taqman +, IgM +, IgG +; Viral culture - at CDC
- ◆ Sample collected 9/27: Taqman -, IgM +

■ Infant test results

- ◆ Serum collected 9/27: IgM + (MDCH & CDC)
- ◆ PKU card: Taqman - (MDCH)

MI 0002 cont'd

- Mother reported infant had little outdoor or other exposure to mosquitoes
- Presence of measurable WNV-specific IgM suggests independent IgM production by infant as result of WNV infection via breast milk
- No change in breastfeeding recommendations

Transmission Via Breast Feeding

MMWR10/4/2002



MMWR™

Morbidity and Mortality Weekly Report

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Possible West Nile Virus Transmission to an Infant Through Breast-Feeding — Michigan, 2002

CDC and the Michigan Department of Community Health (MDCH) continue to investigate West Nile Virus (WNV) infection in a woman, who received a blood product later found with evidence of WNV, and in her child, who was exposed to breast milk later found to be WNV positive by TaqMan® (1). This report updates the findings of this investigation.

On September 2, 2002, a woman aged 40 years delivered a healthy infant but required transfusion of two units of packed red blood cells (RBC) for anemia. The patient received the first unit 6 hours after delivery and the second on the following day. The second transfusion was derived from the same donation as a unit of platelets given to a liver transplant recipient who developed confirmed West Nile meningoencephalitis (WNME); the blood donor's original tubing segment from this common donation was WNV positive by TaqMan® (1). Approximately 2 hours after delivery, the patient developed a migraine headache, photophobia, and anemia. The patient had a history of migraine headaches. When she was discharged 2 days after delivery, her headache was resolving. Eight days later, the patient developed a severe, persistent headache that differed qualitatively from her migraine headache. Twelve days after delivery, the patient reported developing fever, and 3 days later she was admitted with a fever of 102.8° F (39.3° C) and peripheral white blood count (WBC) of 2,900/mm³ (normal: 3,900–11,100/mm³). Laboratory examination of the cerebrospinal fluid (CSF) revealed a WBC count of 134/mm³ (normal: <10/mm³) with 10% neutrophils, a protein concentration of 57 mg/dL (normal: 12–60 mg/dL), and a glucose concentration of 57 mg/dL (normal: 40–70 mg/dL). Computerized tomography of the head was normal. A CSF sample tested at MDCH was positive for WNV-specific IgM. The woman recovered from WNME and was discharged from the hospital.

On the day of delivery, the mother began breast-feeding her child and continued (i.e., 6 days after symptom onset) through the second day of the hospitalization for WNME. An undiluted sample of breast milk obtained 16 days after delivery tested positive for WNV by TaqMan® and for WNV-specific IgM and IgG antibody at CDC. Virus culture of this specimen is pending. Testing of a second sample of breast milk collected 24 days after the implicated transfusion was WNV RNA-negative by TaqMan® at MDCH and CDC. A 1:400 dilution of this sample was again WNV-specific IgM-positive at CDC. Although the infant has remained afebrile and healthy, a serum sample from the infant at age 25 days was WNV-specific IgM-positive in testing performed at MDCH and CDC. No cord blood or other products of conception were available for testing. The mother reported that the infant has had little outdoor or other exposure to mosquitoes.

Reported by: A Ognjan, DO, Mount Clemens General Hospital, Mount Clemens, Michigan; ML Boulton, MD, P Somsel, DrPH, MG Stobierski, DVM, G Stolman, PhD, F Downes, DrPH, K Smith, Michigan Dept of Community Health; L Chapman, MD, Div of AIDS, STD, and TB Laboratory Research; L Petersen, MD, A Marfin, MD.

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MI0004 Case Detail

- 12 year old, AML
- Had been in isolation at hospital for 65 continuous days
- Received 83 blood components
- No mosquito exposure, thus only means of transmission was via blood transfusion

Transfusion Investigations: Michigan Summary

- **15 Investigations**

- ◆ **Patients: 7 yr – 80 yr**

- ◆ **Includes 2 donors (1 organ and 1 blood)**

- ◆ **# Blood Components: 2 – 83**

- ◆ **5 Fatal**

- ◆ **2 Subsequently ruled out as WNV**

West Nile virus infections in blood transfusion recipients, US Summary

- 61 possible cases reported to CDC since Aug 28, 2002
- 19 not transfusion-associated WNV
- 21 had inconclusive investigations
- 21 confirmed cases of transfusion-associated transmission
 - ◆ Aged 7-90 years
 - ◆ 11 Female; 10 Male
 - ◆ 10 were immunocompromised

Prevention of Transfusion-Related Infection

- **Current: donor screening**
- **FDA encouraging development of nucleic acid-based screening tests**
 - ◆ *Will pooled nucleic acid testing have high enough sensitivity?*
 - ◆ *Can these tests, if developed, be implemented in time for the 2003 season?*
- **Retrieval & quarantine of blood products collected during 2002 epidemic period**

Intrauterine WNV Infection

New York, August 2002

- 20 yr old in 27th week of pregnancy
 - ◆ Fever, H/A, blurred vision, vomiting, abdominal & back pain, severe weakness.
 - ◆ 5 weeks later, delivered a live infant; has a number of congenital abnormalities.

- Mother: serum & CSF IgM +
- Infant: serum & CSF IgM +
 - ◆ *MMWR Vol.51/No.50*

Laboratory-Acquired WNV

- 2 laboratory workers
- Percutaneous inoculation
- Illnesses in both: mild & self-limiting
 - ◆ Serum IgM (+) in both cases
- *MMWR Vol 51/No 50*

West Nile virus, 2002: *Emerging issues*

- **Emergence in western U.S.**
- **New modes of transmission**
 - ◆ **Breast milk**
 - ◆ **Transplacental**
 - ◆ **Transfusion / transplantation**
 - ◆ **Laboratory/occupational**
- **Emerging clinical syndromes**
 - ◆ **WN fever**
 - ◆ **WNME / acute flaccid paralysis**
 - ◆ **WNME / rhabdomyolysis**
- **Long-term outcome studies**

2002 SEASON CHALLENGES

- Coordination between multiple agencies
- Deluge of human case appearances
- Rapid communication of results to multiple parties
- New modes of transmission discovered

