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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 anopia. 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.

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Editorial Note: Since WNV was first recognized in the United States in 1999, the infant in this report is the youngest person reported with WNV-specific IgM. Although clinically well, this child was born to a woman who developed WNME 9 days after receiving WNV-contaminated blood after delivery and was breast-fed for the first 17 days. IgM antibodies might be expressed in human milk at low concentrations, but passive transfer of IgM antibodies through breast milk is inefficient (2). As a result, the presence of measurable WNV-specific IgM in the infant suggests independent IgM production by the infant as a result of WNV infection.

Although WNV genetic material was present transiently in breast milk, the specific timing and source of the infant's infection remain unclear. Because neither WNV nor WNV-specific nucleic acids have been identified previously in human breast milk, the implications of this finding are unknown. In addition, maternal infection probably occurred when the mother received a transfusion during the immediate postpartum period, making it unlikely that infection occurred *in utero*. Because of the infant's minimal outdoor exposure, it is unlikely that infection was acquired from a mosquito. Therefore, breast milk must be considered as the most likely source of infection.

WNV illnesses in children aged <1 year appear to be infrequent. During 1999–2001, no cases were reported to CDC. In 2002, four infants with WNV illnesses have been reported (ages 2, 3, 9, and 11 months) to ArboNET (CDC, unpublished data, 2002). Retrospective investigations are under way to determine if these infants were potentially infected with WNV through breast-feeding. Laboratory investigations, including attempts to culture WNV from additional breast milk samples, are under way. Until live virus is cultured from breast milk, or until definitive data are obtained to document WNV transmission through breast milk, the findings described in this report should be interpreted with caution.

The infant described in this report remains healthy. Because the health benefits of breast-feeding are well established (1) and the risk for WNV transmission through breast-feeding is unknown, these findings do not suggest a change in breast-feeding recommendations.

References

1. CDC Update. Investigation of West Nile Virus Infections in recipients of Organ Transplantation and Blood Transfusion—Michigan, 2002. *MMWR* 2002;51:879.
2. Lawrence RA. Breastfeeding: a guide for the medical profession, 4th ed. St. Louis, Missouri: Mosby, 1994.