

Unprotected People #71

Rabies

Wisconsin Teen Survives Clinical Rabies Without Pre- or Postexposure Prophylaxis

Bitten by a bat in September 2004, a 15-year-old Wisconsin girl was hospitalized in October. Subsequently, the patient's bat-bite history was reported, and rabies was diagnosed. Clinical management included intubation, drug-induced coma, ventilator support, and intravenous administration of ribavirin. The patient survived, making her the only person documented to have recovered from clinically diagnosed rabies without pre- or postexposure prophylaxis. As of December 17, the patient remained hospitalized, undergoing rehabilitation. Prognosis for her full recovery was unknown.

Though the patient survived, no proven therapy for clinical rabies has been established, and the reasons for recovery in this case are unknown. It remains important for clinicians and the public to be aware of the risk of contracting rabies from direct contact with bats and other wildlife and to follow the steps outlined in the concluding paragraph of the report reprinted below.

Titled "Recovery of a Patient from Clinical Rabies—Wisconsin, 2004," the report initially appeared in MMWR on December 24, 2004. It was reported by the following from Wisconsin: RE Willoughby, MD, and MM Rotar of Children's Hospital of Wisconsin, Milwaukee; HL Dhonau, MD, and KM Ericksen of Agnesian HealthCare, Fond du Lac; DL Cappozzo of Fond du Lac County Health Dept.; JJ Kazmierczak, DVM, and JP Davis, MD, of Wisconsin Div. of Public Health. Contributors from CDC include CE Rupprecht, VMD, of Div. of Viral and Rickettsial Diseases; AP Newman, DVM, and AS Chapman, DVM, Epidemic Intelligence Service officers.

Recovery of a Patient from Clinical Rabies—Wisconsin, 2004

Rabies is a viral infection of the central nervous system, usually contracted from the bite of an

infected animal, and is nearly always fatal without proper postexposure prophylaxis (PEP). In October 2004, a previously healthy female aged 15 years in Fond du Lac County, Wisconsin, received a diagnosis of rabies after being bitten by a bat approximately 1 month before symptom onset. This report summarizes the investigation conducted by the Wisconsin Division of Public Health (WDPH), the public health response in Fond du Lac County, and the patient's clinical course through December 17. This is the first documented recovery from clinical rabies by a patient who had not received either pre- or postexposure prophylaxis for rabies.

While attending a church service in September, the girl picked up a bat after she saw it fall to the floor. She released the bat outside the building; it was not captured for rabies testing, and no one else touched the bat. While handling the bat, she was bitten on her left index finger. The wound was approximately 5 mm in length with some blood present at the margins; it was cleaned with hydrogen peroxide. Medical attention was not sought, and rabies PEP was not administered.

Approximately 1 month after the bat bite, the girl complained of fatigue and tingling and numbness of the left hand. These symptoms persisted, and 2 days later she felt unsteady and developed diplopia (i.e., double vision). On the third day of illness, with continued diplopia and onset of nausea and vomiting, she was examined by her pediatrician and referred to a neurologist. At that time, the patient continued to have blurred vision and also had partial bilateral sixth-nerve palsy. Magnetic resonance imaging (MRI) with and without contrast and magnetic resonance angiography (MRA) studies of her brain were normal, and the patient was sent home.

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On the fourth day of illness, the patient's symptoms continued, and she was admitted to a local hospital for lumbar puncture and supportive care. On admission, she was afebrile, alert, and able to follow commands. She had partial sixth-nerve palsy, blurred vision, and unsteady gait. Standard precautions for infection control were observed. Lumbar puncture revealed a white blood cell count of 23 cells/microliter (normal: 0 cells/microliter) with 93% lymphocytes, a red blood cell count of 3 cells/microliter (normal: 0 cells/microliter), a protein concentration of 50 mg/dL (normal: 15-45 mg/dL), and a glucose concentration of 58 mg/dL (normal: 40-70 mg/dL). During the next 36 hours, she had slurred speech, nystagmus, tremors of the left arm, increased lethargy, and a temperature of 102 degrees F (38.9 degrees C).

On the sixth day of illness, the bat-bite history was reported, and rabies was considered in the differential diagnosis. The patient was transferred to a tertiary-care hospital. Because rabies was recognized as a possibility, expanded infection-control measures, including droplet precautions and one-to-one nursing, were instituted at time of transport. On arrival, the patient had a temperature of 100.9 degrees F (38.3 degrees C), impaired muscular coordination, difficulty speaking, double vision, muscular twitching, and tremors in the left arm. She was somewhat obtunded but answered questions appropriately and complied with commands.

Blood serum, cerebrospinal fluid (CSF), nuchal skin samples, and saliva were submitted to CDC for rabies testing. MRI with and without contrast and angiogram/venogram sequences were normal. She had hypersalivation and was intubated. Rabies-virus-specific antibodies were detected in the patient's serum and CSF. Direct fluorescent antibody staining of nuchal skin biopsies was negative for viral antigen, and rabies virus was not isolated from saliva by cell culture. Rabies-virus RNA was not detectable by reverse transcriptase polymerase chain reaction assay of either sample. Therefore, identification of the virus variant responsible for this infection was not possible.

Clinical management of the patient consisted of supportive care and neuroprotective measures, including a drug-induced coma and ventilator support. Intravenous ribavirin was used under an investigational protocol. The patient was kept comatose for 7 days; during that period, results from lumbar puncture indicated an increase in antirabies IgG [immunoglobulin G] by immunofluorescent assay from 1:32 to 1:2,048. Her coma medications were tapered, and the patient became increasingly alert. On the 33rd day of illness, she was extubated; 3 days later she was transferred to a rehabilitation unit. At the time of transfer, she was unable to speak after prolonged intubation. As of December 17, the patient remained hospitalized with steady improvement. She was able to walk with assistance, ride a stationary cycle for 8 minutes, and feed herself a soft, solid diet. She solved math puzzles, used sign language, and was regaining the ability to speak. The prognosis for her full recovery is unknown.

To provide community members accurate information about rabies and its transmission, local and state health officials held a press conference on October 21. Public health officials and community pediatricians visited the patient's school to assess the need for rabies prophylaxis among students. WDPH distributed assessment tools to the local health department to screen healthcare workers and community contacts of the patient for exposure to potentially infectious secretions. The patient's five family members, five of 35 healthcare workers, and 27 of 55 community contacts received rabies PEP, either because of exposure to the patient's saliva during sharing of beverages or food items or after contact with vomitus. No healthcare workers at the tertiary-care hospital required PEP. Site inspection of the church revealed no ongoing risk for exposure to bats.

Editorial Note

This case represents the sixth known occurrence of human recovery after rabies infection; however, the case is unique because the patient received no rabies prophylaxis either before or after illness onset. Historically, the mortality rate among

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previously unvaccinated rabies patients has been 100%. The five previous patients who survived were either previously vaccinated or received some form of PEP before the onset of illness. As in this case, viral antigen was not detected nor was virus isolated from those patients; increased antibody titers detected in serum and CSF (inconsistent with vaccination alone) confirmed the diagnosis of clinical rabies. Only one of the five patients recovered without neurologic sequelae. No specific course of treatment for rabies in humans has been demonstrated to be effective, but a combination of treatments, which might include rabies vaccine, rabies immune globulin, monoclonal antibodies, ribavirin, interferon-alpha, or ketamine, has been proposed. Given the lack of therapeutic utility observed to date, and because the patient had rabies-virus-neutralizing antibodies on diagnosis, a decision was made to avoid use of immune-modulators (e.g., rabies vaccine, rabies immune globulin, or interferon). However, the particular benefits of the regimen received by this patient remain to be determined.

The history of a bat bite 1 month before this patient's illness suggests an etiology of bat-associated rabies-virus variant. This is consistent with the epidemiologic pattern of rabies in humans in the United States during the preceding 2 decades. During 1980-2000, a total of 26 (74%) of rabies-virus variants obtained from patients in the United States were associated with insectivorous bats, most commonly silver-haired and eastern pipistrelle bats, including a variant from a fatal case of rabies reported in Wisconsin in 2000.

In this case, only five healthcare workers received PEP. Previous reports of rabies cases have noted large numbers of contacts being treated; however, delivery of health care to a patient with rabies is not an indication for PEP unless the mucous membranes or open wound of a healthcare worker are

contaminated by infectious material (e.g., saliva, tears, CSF, or neurologic tissue). Adherence to standard precautions for infection control will minimize the risk for exposure.

Rabies in humans is preventable with proper wound care and timely and appropriate administration of PEP before onset of clinical disease. PEP is recommended for all persons with a bite, scratch, or mucous-membrane exposure to a bat, unless the bat tests negative for rabies. When direct contact between a human and a bat has occurred and the animal is not available for testing, PEP should be administered when a strong probability of exposure exists. However, if a bat bite is unrecognized or if the significance of exposure is underestimated, medical intervention might not be sought and appropriate treatment not administered. Once clinical signs of rabies are evident, a progressive and usually fatal encephalitis ensues.

This report underscores the need for increasing public awareness to minimize the risk for rabies following contact with bats and other wildlife. Persons bitten by a potentially rabid animal should immediately (1) wash the wound thoroughly with soap and water, (2) capture the animal (if this can be done safely by avoiding direct contact) and submit it for testing or quarantine, (3) contact local or state public health officials, and (4) visit a physician for treatment and evaluation regarding the need for PEP. Persons should not handle or keep bats as pets and should keep bats away from living quarters and public places. Despite the recovery of this patient, no proven therapy for clinical rabies has been established, and the reasons for recovery in this case are unknown. Clinicians and the public should recognize the risk for contracting rabies from any direct contact with bats and not regard it as a curable disease on the basis of the outcome of this case.