

Unprotected People #37

Rabies

Human rabies — California, Georgia, Minnesota, New York, and Wisconsin

The following case reports of five people in the United States who died of rabies in the year 2000 appeared in the December 15, 2000, issue of MORBIDITY AND MORTALITY WEEKLY REPORT. On September 20, October 9, 10, 25, and November 1, 2000, persons who resided in California, New York, Georgia, Minnesota, and Wisconsin, respectively, died of rabies. This report summarizes the case investigations.

California

On September 15, a 49-year-old man visited a neurologist with 2 days of increasing right arm pain and paresthesias. The neurologist diagnosed atypical neuropathy. The symptoms increased and were accompanied by hand spasms and sweating on the right side of the face and trunk. The patient was discharged twice from an emergency department but symptoms worsened. After developing dysphagia, hypersalivation, agitation, and generalized muscle twitching, the patient was admitted to a local hospital on September 16. Vital signs and blood tests were normal, but within hours he became confused. The consulting neurologist suspected rabies. Rabies immune globulin, vaccine, and acyclovir were administered. On September 17, the patient was placed on mechanical ventilation and rabies tests returned positive. Renal failure developed and the patient died on September 20. The patient did not report contact with a bat, although his wife reported that in June or July a bat had flown into their house and the patient had removed it.

New York

On September 22, a 54-year-old man who had resided in Ghana arrived in the United States, and on September 26, reported discomfort in his right lower back. During the next few days, the pain intensified and alternated with abdominal discomfort. He developed restlessness and anxiety. On September 30, he was admitted to a local hospital for

suspected bowel obstruction. On examination, the patient appeared anxious and had right flank tenderness, diaphoresis, spontaneous ejaculation, soft tissue swelling of the right lumbar area, vomiting, and a temperature of 99.3 F (37.4 C). Other symptoms appeared within hours, including dysphagia, dizziness, shortness of breath, and paranoia. The patient became delirious, with frothing and agitation. On October 1, the patient had a cardiac arrest, was resuscitated, and placed on mechanical ventilation. Rabies tests were positive on October 3. After a gradual decrease in respiration, heart rate, and blood pressure, the patient died on October 9. History from the patient's employer in Ghana revealed that the patient had been bitten in Ghana on his thumb and leg by his unvaccinated puppy in May.

Georgia

On October 3, a 26-year-old man developed intractable vomiting and hematemesis. At a local hospital, he was treated with antiemetic suppositories; that evening he became disoriented, combative, and had difficulty breathing. On October 5, he became hypotensive and hypoxic and was transferred to a referral hospital for ventilatory support. Examination revealed a temperature of 104 F (40 C), anisocoria, copious oral secretions, scattered bilateral pulmonary crackles, and a white blood cell count (WBC) of 46.6 cells $\times 10^9/L$ (normal: 5—10 $\times 10^9/L$); a chest radiograph revealed bilateral diffuse alveolar densities. Broad spectrum antibiotics, including acyclovir, were initiated. On October 9, the patient developed cardiac arrhythmia, hypotension, and became combative, necessitating sedative and paralytic agent therapies. He developed respiratory and renal failure and died on October 10. Since July, the patient had been renting a room on the upper floor of an old house. He had reported to co-workers that bats from the attic had entered his living quarters and

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landed on him while he slept. Investigation of the house occupied by the patient since July revealed a colony of approximately 200 Mexican free-tailed bats in the attic and openings between the attic and the patient's bedroom, bathroom, closet, and kitchen.

Minnesota

On October 14, a 47-year-old man visited a local clinic with 6 days of worsening right arm pain and paresthesias. Two days later he developed decreased right finger movement. Nerve conduction studies were consistent with carpal tunnel syndrome. On October 19, while traveling in North Dakota, the patient was admitted to a North Dakota hospital with a temperature of 103 F (39.4 C), flaccid paralysis and sensory loss in the right upper extremity, sensory loss in the mid-thoracic area, hypoesthesia and hyporeflexia in the left upper extremity, and anisocoria. Laboratory findings were normal except a WBC count of $13.8 \times 10^9/L$. The patient was placed on broad spectrum antibiotics. On October 20, the patient developed acute respiratory failure and was intubated. Magnetic resonance imaging was consistent with myelitis and ganciclovir was added to antibiotic coverage. He died on October 25. Three days earlier, a friend told the family that during August 11-19, the patient had been awakened by a bat on his right hand. He killed the bat and was bitten in the process. The patient did not seek medical care. Investigation found in the patient's house multiple portals of entry for bats, openings between the attic and living areas, and extensive deposits of guano in the attic and living area.

Wisconsin

On October 14, a 69-year-old man with a 2-day history of chest discomfort and numbness, tingling, and tremors of the left arm was admitted to a local hospital for cardiac evaluation. On October 16, the patient had onset of progressive dysphagia, diaphoresis, delirium, and myoclonus. The patient was treated with intravenous antibiotics for possible sepsis and acyclovir for suspected herpes encephalitis. He developed renal insufficiency requiring hemodialysis and respiratory failure necessitating mechanical ventilation. A serum rapid fluorescent

focus inhibition test for rabies antibodies was negative on October 18. The patient died on November 1, and postmortem examination of the brain revealed Negri bodies. Subsequent testing confirmed a diagnosis of rabies. The patient had told a friend that two or three times a year he had removed bats from his house with his bare hands; several other residences used by the patient also had potential portals for the entry of bats. He did not mention being bitten by an animal but had asked a friend a week before admission if rabies could be acquired from an insect bite.

Editorial Note:

These five cases of human rabies are the first diagnosed in the United States since December 1998, and underscore that rabies should be considered in any patient with progressive encephalitis. The initial presentations of rabies can be diverse and a history of animal contact is rarely obtained. Because the immune response to rabies may not occur until late in the disease, if rabies is suspected, an antemortem examination should include a nuchal skin biopsy, saliva, and cerebral spinal fluid or a postmortem examination of central nervous system tissue.

In the United States since 1990, infection with indigenous rabies virus variants associated with insectivorous bats and infection with foreign canine rabies virus variants have accounted for 30 of the 32 human cases. Although 24 (74%) of the 32 cases since 1990 have been attributed to bat-associated variants of the virus, a history of a bite was established in only two cases. Contact with bats occurred in approximately half of the other cases. These cases represent various bat-contact histories: a bat bite, direct contact with bats with multiple opportunities to be bitten, and possible direct contact with a bat. Canine rabies is prevalent in Africa, Asia, and Latin America. Worldwide estimates of human rabies deaths exceed 50,000 cases each year, and >95% of reported cases occur in regions where canine rabies is endemic.

Although rabies usually is transmitted by a bite, persons may minimize the medical implications of a bat bite. Unlike bites from larger animals, the trauma

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of a bat bite is unlikely to warrant seeking medical care. Unless the potential for rabies exposure is known to the patient, rabies postexposure prophylaxis (PEP) will not be received. Although bat rabies virus variants can be transmitted secondarily from terrestrial mammals, the lack of other animal-bite histories and the rarity of bat rabies virus variants found in terrestrial mammals suggest that this means of transmission is rare.

Persons who are bitten or scratched by any animal should wash wounds thoroughly and seek immediate medical attention to evaluate the need for PEP. In all cases where bat-human contact has occurred or is suspected, the bat should be collected and tested for rabies. If the bat is unavailable, the need for PEP

should be assessed by public health officials. PEP should be considered after direct contact between a human and a bat, unless the exposed person can be certain a bite, scratch, or mucous membrane exposure did not occur. PEP may be considered for persons who were in the same room as a bat and who might be unaware that a bite or direct contact had occurred (e.g., when a sleeping person wakes to find a bat in the room or an adult witnesses a bat in the room with an unattended child, mentally disabled person, or intoxicated person). PEP is not warranted when direct contact between a human and a bat did not occur. Seeing a bat or being in the vicinity of bats does not constitute an exposure.