

First Human Rabies Case in Missouri in 50 years Causes Death in Outdoorsman

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Abstract

This report describes the first case of human rabies in Missouri in 50 years that resulted in a patient fatality. Current rabies epidemiology, treatment and management of exposures, and the signs and symptoms and treatment of human rabies is discussed.

Introduction

During period from 2000 to 2007, 25 human rabies cases were reported in the United States.¹ Globally, rabies encephalitis results in over 55,000 deaths annually.² In November of 2008, Missouri experienced its first human case of rabies since 1959. The patient died from the infection that was likely bat-bite transmitted.

Case Report

On November 19, 2008, a 55-year-old white male from a rural area in southeast Missouri known for endemic rabies among wildlife developed pruritus of the left ear and left arm which progressed to arm and face paresthesias. He

presented to the local Emergency Department (ED) on 11/21/08 complaining of chest and back pain. He received a cardiovascular evaluation and was discharged home. He returned to the ED the following day with worsening chest pain, agitation, and mental confusion. At that visit, his fiancée reported the patient had been bitten in his home by a bat on the left ear four to six weeks prior to symptom onset. The patient revealed that he kept the bat for three days for a self-imposed quarantine, and then released the bat without notifying public health authorities. Rabies was suspected and the patient was given human rabies immune globulin (HRIG) and the first dose of rabies vaccine on 11/22/2008. The next day, he was seen at a different hospital and released home, but returned to the local ED later that day with complaints of dehydration, generalized shaking, tingling of the left face, and hydrophobia and he was transferred to a tertiary care hospital. The hospital admission CBC, cerebrospinal (CSF) analysis, and head CT were unremarkable.

Figure 1
Silver-haired bats often roost in tree cavities and are a vector for rabies.



Table 1
*Average Number of Rabid Animals and Percent of Tested Who are Positive, by Species, Missouri, 1999-2008**

Species	Mean # Cases	% Positive
Skunk	9.2	22.3
Bat	39.4	4.1
Horse	0.7	3.7
Cattle	0.4	1.8
Fox	0.1	0.9
Cat	0.5	0.1
Dog	0.4	0.1
Raccoon	0.1	0.1

**Missouri Department of Health and Senior Services 2008 rabies surveillance data (unpublished).*

Following admission the patient became combative and more confused, and he required sedation. Specimens for rabies testing were obtained. Nuchal biopsy was positive by reverse transcription polymerase chain reaction (RT-PCR) and direct fluorescent antibody (DFA). Serum was positive by rapid fluorescent focus inhibition test

rabies post-exposure prophylaxis (RPEP) due to close association with the patient and/or possible contact with the bat. In addition, one physician who reportedly had hand lesions and did not use gloves while examining the patient's mouth received RPEP. Postmortem CNS tissues were positive for rabies virus antigen by DFA.

(RFFIT) and saliva by reverse transcription polymerase chain reaction (RT-PCR). Treatment followed the "Milwaukee Protocol" which included a regimen of ketamine, benzodiazepines, and amantadine³. The patient's condition continued to worsen and he died on 11/30/2008.

Four exposed contacts received

Discussion

In this patient, rabies was most likely acquired from the bat though the reported bat was unavailable for definitive testing. The patient was an avid outdoorsman and often kept wild animals as pets. Since the incubation period of rabies averages two to three months but can range from two weeks to several years, the possibility that rabies was acquired by the patient from a different exposure cannot be ruled out. However, the (sequence analysis of amplicons) obtained by RT-PCR tests of the saliva and skin biopsy was consistent with a rabies virus found in silver-haired bats in the United States. See Figure 1.

According to the CDC's 2007 rabies surveillance, 93% of all animal rabies cases in the United States were in wildlife, and only 7% were in domestic animals.¹ Raccoon rabies is enzootic in all of the eastern coastal states, and the skunk rabies is dominant in the north central and south central United State and California. Rabies among insectivorous bats occurs throughout the continental United States. The majority of naturally acquired, indigenous human rabies cases in the United States in recent years have resulted from bat-associated rabies viruses.

In Missouri, the natural reservoir for rabies is primarily found in bats and skunks, but infection is occasionally found in other wild and domestic animals. During 1999-2008 (See Table 1), the average number of rabid animals detected annually was 51. The enzootic/epizootic pattern

of rabies in bats tends to occur independently from patterns in terrestrial mammal species. Over the past ten years, the percentage of bats testing positive for rabies in Missouri has varied from three to six percent, while the percentage of skunks testing positive varied from 10 to 40 percent.

Rabies is usually a fatal illness in humans, but it is preventable with proper wound care and timely, appropriate administration of HRIG and rabies vaccine before onset of clinical symptoms.⁴ RPEP is recommended for all persons who have been bitten by an animal suspected of having rabies. RPEP should be considered in the event of non-bite, potential exposures, such as contamination of open wounds or mucous membranes with saliva from a suspect animal. However, bite lesions from certain animals, particularly bats, can be difficult to detect. RPEP is recommended for all persons with direct transdermal

or mucous membrane exposure to a bat, unless the animal is found not to have rabies.

A high index of suspicion for rabies should be maintained in the differential diagnosis of any unexplained, rapidly progressive neurologic symptoms consistent with a viral encephalitis. Although initial signs and symptoms of rabies are nonspecific, a history of an animal bite or travel to a developing country, combined with clinical signs such as paresthesia, hypersalivation, dysphagia, hydrophobia or aerophobia, flaccid paralysis, behavioral changes, or sudden autonomic instability, should be considered suspicious for rabies. Rapid diagnosis of rabies can be beneficial for the patient and can facilitate appropriate prophylaxis for exposed persons. This report also underscores the need for increased public awareness of the risks of direct contact with bats and other wild animals and

prompt notification of public health authorities.

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Disclosure

None reported.

