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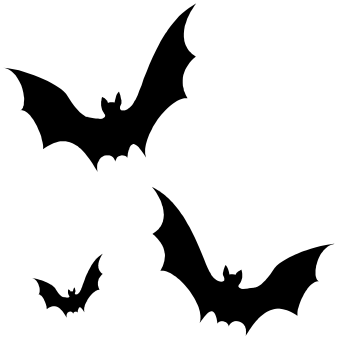
COMMUNITY HEALTH AND SAFETY BULLETIN

SAN FRANCISCO DEPARTMENT OF PUBLIC HEALTH



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RABID BATS IN SAN FRANCISCO'S BEDROOMS?

Erica Pan, MD, MPH & Sandra Huang, MD
Community Health Epidemiology & Disease Control

Your 40 year old patient calls to report that at 6 am, he awoke to find a dead bat in his bedroom. He picked it up before he realized what it was, and he washed his hands thoroughly immediately afterwards. San Francisco Animal Care and Control picked up the bat from his home for rabies testing. He has seen several bats flying outside of his home, but this is the first time he has seen a bat inside. He lives with his wife, three children, and a dog. Should he receive rabies post-exposure prophylaxis (PEP)? Should any other members of his household?

EPIDEMIOLOGY

There is a real risk of rabies in San Francisco, but many people may not know which animals carry the highest risk of rabies in our urban setting. While people worry about dog bites as a risk for human rabies infection, the widespread vaccination of many domestic animals in the United States has shifted the most likely source of human rabies from rabid dog to rabid bat exposures. Between October 2003 and January 2004, three bats tested positive for rabies in San Francisco. All of the 21 nonhuman rabies cases that were reported in San Francisco between 1993 and 2003 occurred in bats. No cases of rabies in terrestrial animals (e.g. dogs, cats, skunks, raccoons, foxes, coyotes) have been reported in San Francisco for over 60 years, but other Bay Area counties have documented rabies in skunks in recent years. Statewide, the vast majority of nonhuman rabies cases occur in bats. During 2003, of the 217 cases of nonhuman rabies reported in California, three-quarters (162) occurred in bats. Almost twenty percent of reported cases (42) were in skunks. Five percent (10) were reported in foxes, and less than 2% of cases occurred in domestic animals (2 dogs and 1 cat).[1] Nationally, the distribution of animal rabies is different than in California, with raccoons and skunks comprising a higher proportion of cases than bats. Additional wild terrestrial carnivores found to harbor rabies in other states include foxes and coyotes.

While more raccoons and skunks tested positive for rabies nationally, bats are still more likely to be associated with transmission to humans. Molecular typing of rabies viruses revealed that over 90% of United States (US)-acquired human rabies cases reported since 1990 were bat-variant rabies virus.[2] Among 35 domestic rabies cases acquired in the US between 1958-2000, 32 (91%) were bat-variant rabies virus.[3] Internationally, dogs remain the most common source of rabies among the approximately 40,000-70,000 annual human cases, especially in countries in Asia, Eastern Europe, Africa, and parts of Latin America.[4]

Human rabies cases have occurred in recent years in northern California, usually resulting from encounters with infected bats. In September 2003, a 66-year-old man from Trinity County died of rabies. Approximately one month prior to his symptom onset, he was bitten by a bat while he was asleep and awoke to find it crawling on his back; he did not seek rabies PEP.[5] In March of 2002 in Glenn County, a 28-year old man died of rabies approximately three weeks after killing a bat in his house. A bat colony was discovered in the attic of the patient's house, but no known bite exposure was reported.[6] In San Francisco, the last case of human rabies occurred in 1987; and the presumed source was a dog bite that occurred while the patient was in the Phillippines seven years earlier.

CLINICAL FEATURES

Initial symptoms of rabies infection in humans are nonspecific and include fever, headache, malaise and occasionally nausea and vomiting. As the disease progresses, neurologic symptoms such as paresthesias, anxiety, confusion, and agitation may occur, then evolve to delirium, abnormal behavior, hallucinations, hydrophobia, insomnia and paralysis. Finally, paralysis progresses to coma and death, usually within three weeks. The incubation period may vary from a few days to more than 19 years, but typically ranges from one to three months. Human rabies is universally fatal in previously unvaccinated persons. Only six survivors have ever been reported, and all six had received rabies vaccine prior to disease onset. Treatment is primarily supportive, and prompt consultation with an infectious disease specialist and public health officials is strongly advised for suspected rabies cases to optimize timely diagnosis and ensure

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Laboratory testing for rabies virus can be arranged through the San Francisco Public Health Laboratory.

WHO TO CALL IN SAN FRANCISCO:

To report an animal bite or dead bat contact Animal Care and Control:
(415) 554-9422 or
(415) 554-9400 24/7 line

To report a possible rabies exposure or discuss the need for PEP contact CDCU:
(415) 554-2830
(after hours press "1" to page the on call MD)

appropriate prophylaxis for other potentially exposed individuals. Laboratory testing for rabies virus can be arranged through the San Francisco Public Health Laboratory. While human to human transmission is a theoretical concern, no human rabies cases have been reported in association with health care worker occupational exposure.[7]

WHAT TO DO ABOUT SUSPECTED RABIES EXPOSURE IN SAN FRANCISCO

In San Francisco, animal bites and potential bat exposures should be reported immediately to Animal Care and Control (ACC) at 554-9422 (or 554-9400 after hours). The ACC will dispatch a controller to procure and isolate animals as necessary. **To report a possible rabies exposure or to discuss PEP recommendations, call our Communicable Disease Control Unit (CDCU) at 554-2830**. Our unit can assist with 1) interviewing cases and evaluating for rabies exposure, 2) collaborating with ACC to procure, isolate, vaccinate, or euthanize potentially rabid animals as appropriate, 3) working with our public health laboratory to expedite animal testing for rabies and communicating the results to you and/or your patient, and 4) making recommendations for rabies PEP. In addition, we can also assist with directing your patients to the appropriate locations for rabies PEP. HRIG and rabies vaccine are generally only available at hospital pharmacies. Our Adult Immunization Clinic also provides rabies vaccination for follow-up doses, but HRIG and wound care are currently not available there.

POST-EXPOSURE PROPHYLAXIS RECOMMENDATIONS

Decisions and recommendations for rabies PEP are based on several key factors. The type of exposure, the likelihood that the animal responsible for the exposure is rabid, and the ability to obtain and test the animal for rabies virus are all important considerations. Rabies is transmitted when the virus is introduced via saliva or nervous system tissue and penetrates into soft tissue or mucous membranes. Thus, clinicians and public health officials need to elicit detailed information about the exposure. Was the exposure a bite or non-bite? Bites pose a higher risk than non-bites. All bites represent a potential risk of rabies transmission. Animal scratches, or contamination of abrasions, wounds, or mucous membranes may constitute a nonbite exposure. The highest risk nonbite exposures are reported in persons exposed to large amounts of aerosolized rabies virus in laboratories or while spelunking in caves in the Southwest with large colonies of bats.[8]

After considering the extent of exposure, assess the probability that the animal has rabies disease. As described above, bats are by far the most likely animal to expose humans to rabies, especially in San Francisco. Perceived non-bite exposures from bats must be carefully evaluated. They can inflict a minor injury that may go unnoticed by a patient or clinician. In at least 1/3 of human cases with bat-variant rabies reported in the U.S. between 1980 and 1998, no bat exposure was reported. In approximately half of cases, contact with bats was reported, but no bite was noted.[3] Situations where it may be impossible to determine if a direct exposure occurred include individuals awakening to find a bat in the room, a bat in a house or a room of an unattended young child, or other individuals who may not have the cognitive ability to notice or communicate that direct contact with a bat may have occurred. If the possibility of a bite exposure cannot be reasonably excluded, the standard of care is to recommend rabies PEP.

In addition, unprovoked bites or exposures to animals behaving strangely raise concern that the animal is more likely to have rabies. Signs of rabies are difficult to interpret in wildlife such as skunks, raccoons, foxes, and coyotes, thus if a significant exposure occurs these animals should be captured, euthanized and tested for rabies virus if possible. The exposed person should be offered rabies PEP unless the animal is tested and proven to be negative for rabies virus. Small rodents (e.g. squirrels, rats, and mice) and lagomorphs (such as rabbits and hares) are almost never infected with rabies and have not been reported to have transmitted rabies to humans.

ADMINISTRATION

There are several important components of rabies PEP: passive immunization, active immunization, and wound care. Human Rabies Immune Globulin (HRIG) is indicated for immediate passive immunization and should be given once at the beginning of rabies PEP to any exposed case who has not previously received rabies vaccination. It can be given up to seven days after the first dose of rabies vaccine without interfering with natural antibody production. The dose is 20 IU/kg and the dose should be infiltrated into and around the wound site if one is identified. Any remaining HRIG should be administered intramuscularly at a site distant from where the rabies vaccine is injected. Both formulations of HRIG available in the U.S. are considered equally efficacious. Potential side effects include local pain at the injection site and low-grade fever. There are three major preparations of inactivated rabies vaccine currently available in the United States (HDCV,

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RVA, and PCEC). All are compatible with HRIG and are considered equally efficacious and safe. The recommended regimen consists of five 1.0 mL doses given at days 0, 3, 7, 14, and 28 intramuscularly in the deltoid (or anterolateral thigh in young children). Vaccine should not be administered in the gluteal area and may be less efficacious when given there. Side effects reported with the three available formulations are less serious and less common than with previously available vaccines. Mild local reactions may still occur, or rarely, symptoms such as headache, nausea, abdominal pain, muscle aches and dizziness have been reported. Three cases of a Guillan-Barre- syndrome like illness have been reported after rabies vaccination with complete recovery. Approximately 6% of booster doses given for pre-exposure prophylaxis to individuals at high risk for occupational exposure with the Human Diploid Cell Vaccine preparation have been associated with immune-complex-like reactions including hives, arthralgias, and fever. Rare failures of the recommended PEP regimen have only been reported overseas when inadequate or improperly administered PEP was given.[8] Aggressive wound care and treatment is also essential to reducing the risk of rabies transmission. Immediate and thorough wound cleansing and irrigation with soap, water, and a virucidal agent such as povidine-iodine are indicated, as well as consideration of tetanus prophylaxis, prophylaxis for bacterial infection, and wound suture as appropriate.

PREVENTION

Important methods of rabies prevention include vaccinating domestic animals (e.g. dogs and cats) per recommended schedules, vaccinating persons in groups at high-risk for exposure secondary to occupation or travel, and most importantly educating the general public ***never*** to handle or provoke wild animals, especially sick or dead bats. Additional information for homeowners is available from Bat Conservation International regarding prevention and exclusion of bats from entering households via their website (www.batcon.org), or their local contact at: 415-893-9532.

ANSWER TO THE CASE PRESENTATION

Additional investigation of this case was necessary to make rabies PEP recommendations. Further questioning revealed that this man's wife was the only other person asleep in the same room with him the night before he discovered the dead bat. The bedroom door was closed and one window was open, thus it seemed unlikely that the bat had flown further into the house or exposed others. There were no previous observations of bats inside the house, and the children had not been unsupervised or asleep in the same bedroom. Their dog also slept in the bedroom and its most recent rabies vaccination was 11 months prior. Thus, since the bat tested positive for rabies, and it was not possible to exclude the possibility of a bat bite or significant exposure, rabies PEP was recommended for the man and his wife, but not for the children. In addition, the family dog was also required to be revaccinated immediately and placed in strict isolation in the home for 30 days.

REFERENCES

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4. World Health Organization. Fact sheet No. 99. Document http://www.who.int.inf-fs/en/fact099.html Geneva: World Health Organization, 2001.
5. Centers for Disease Control and Prevention. Human Death Associated with Bat Rabies — California, 2003. MMWR 2004;53:33-35.
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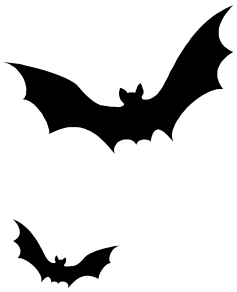
7. Centers for Disease Control and Prevention. First Human Death Associated with Raccoon Rabies— Virginia, 2003. MMWR 2003;52:1102-1103.
8. Centers for Disease Control and Prevention. First Human Rabies Prevention—United States, 1999: Recommendations of the Advisory Com mittee on Immunization Practices (ACIP). MMWR 1999; 48 (No. RR-1):1-21.

ADDITIONAL USEFUL REFERENCES AND RESOURCES:

California Compendium of Rabies Control and Prevention, 2004. California State Department of Health Services, Division of Communicable Disease Control, Veterinary Public Health Section *www.dhs.ca.gov/ps/dcdc/disb/pdf/2004%20CA%20Rabies%20Compendium.pdf*

Center for Disease Control Website: *www.cdc.gov/ncidod/dvrd/rabies/default.htm*

Bat Conservation International: *www.batcon.org*



TAKE HOME POINTS ABOUT RABIES PEP

Is the mammal at high risk for rabies infection? *In the Bay Area most likely culprits are bats, bats, bats, and skunks.*

Was the animal behaving strangely? *Unprovoked attack is higher risk than provoked.*

How significant was the exposure? *Bites are worse than non-bites; facial bites are the highest risk. Determining bat exposure is tricky, history of a bite is not necessary — err on the side of giving PEP.*

Report the bite to Animal Care & Control so the animal can be tested or quarantined.

Remember wound washing, Td immunization, & treatment of bacterial infection.

Rabies PEP=HRIG infiltrated in wound + 5 doses rabies vaccine IM in deltoid on Days 0,3,7,14,28—stick to this schedule.

Don't inject HRIG and vaccine in the same anatomical site.

Call SFDPH CDCU for ?'s about PEP @ (415) 554-2830

NEW TUBERCULOSIS BLOOD TEST

Masae Kawamura, MD
Tuberculosis (TB) Control

The San Francisco TB Control program in collaboration with the Department of Public Health Laboratory has replaced the tuberculin skin test (TST) with the QuantiFERON-TB Test (QFT) for screening of selected patients for TB. The QuantiFERON-TB test (QFT) is an FDA-approved whole-blood test that measures the patient's immune reactivity to *Mycobacterium tuberculosis*, the bacterium that causes TB. Utilizing the QFT test eliminates TST placement error, the need for a return visit, TST reader error, and the confounding TST "booster" phenomenon. The QFT test is currently available exclusively through the TB control program, and will not be available to the general public. However, results will be posted in the SFDPH/Community Health Network clinical record system under the "immunizations" section. Please utilize the QFT results as you would TST results; like the TST, the QFT is a useful diagnostic aide, but it does not replace clinical judgment for the diagnosis of TB disease. A positive QFT will require additional tests to exclude TB disease (chest x-ray and medical evaluation). Patients with a positive QFT but no evidence of active TB disease may have latent tuberculosis infection. If patients with latent TB infection are treated appropriately, the risk of progression to active TB disease is substantially reduced.

SAN FRANCISCO BAY AREA CRYPTOSPORIDIOSIS SURVEILLANCE PROJECT

June Weintraub, ScD
Occupational & Environmental Health Section

On June 1, 2003, the San Francisco Bay Area Cryptosporidiosis Surveillance Project moved to the San Francisco Department of Public Health (SFDPH). SFDPH and the California Emerging Infections Program (CEIP) are now collaborating to conduct cryptosporidiosis surveillance in the San Francisco Bay Area. However, because CEIP is continuing to collect cryptosporidiosis cases for all other counties under the FoodNet program, this move will only affect case reporting for San Mateo, Santa Clara and Tuolumne Counties. Cases occurring in all other Bay Area counties will continue to be reported to CEIP, and CEIP and will forward case information to SFDPH.

Cryptosporidiosis is a disease characterized by diarrhea or stomach cramps caused by infection with the protozoan parasite *Cryptosporidium parvum.* The strongest determinant of getting cryptosporidiosis is immunosuppression. Though the disease is self-limited in healthy persons, in those who are immunosuppressed, it may cause chronic debilitating illness. In the last few years, cryptosporidiosis has decreased dramatically among people with AIDS in San Francisco. This decrease is due to the use of highly active antiretroviral therapy (HAART), which improves immune status and helps patients with compromised immune systems mount an appropriate immune response to infection with *C. parvum*. Now that HAART is available, the MOST important intervention for reducing risk of cryptosporidiosis among AIDS patients is preserving or re-constituting their immune competence with HAART. Even though San Francisco's pristine water source has very little cryptosporidium, some immunocompromised patients may want to consider tap water avoidance or boiling. In a non-outbreak setting, cryptosporidiosis is not associated with tap water consumption in immunocompetent persons.

Later in 2004, the project will be conducting a survey of Bay Area physicians. For more information on cryptosporidium or the surveillance project, please visit the project website at *http://www.sfdph.org/ehs/phes/water/crypto.htm* or the project coordinator Magdalena Berger at 415-252-3968.

San Francisco Department of Public Health
101 Grove Street. San Francisco, CA 94102

The Community Health & Safety Bulletin is also online at: **www.sfdph.org/chsb.**

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