



Facts on the Fly!

ANSWERS TO QUESTIONS ABOUT BATS AND RABIES

What is rabies, and how is it transmitted?

Rabies is an infectious viral disease that invades the central nervous system of humans and other warm-blooded animals. A wide variety of mammals can contract or transmit the disease, but it is most often noticed in dogs, cats, foxes, raccoons, skunks, coyotes, bats, and livestock. Worldwide, more than 30,000 humans die of rabies each year, 99% of these cases resulting from contact with dogs. In the United States, due to highly successful dog vaccination programs, transmission from dogs is now rare, eliminating the vast majority of human cases.

Rabies is nearly always transmitted by a bite, though non-bite exposures can result from contact between infected saliva or nervous tissues and open wounds or the mucous membranes of the eyes, nose, or mouth. Bites during careless handling are the primary source of rabies exposure from bats.

Rabies virus has not been isolated from bat blood, urine or feces, and there is no evidence of air-borne transmission outside of caves. Two cases of aerosol transmission were reported in the 1950's in Texas caves that support very unusual environments. However, no similar cases have occurred since, despite the fact that many thousands of people explore bat caves each year.

Do large bat populations lead to increased incidence of rabies transmission to humans?

The largest urban bat populations consist almost exclusively of colonial species, and there is no evidence linking them to increased transmission to humans. Tens of thousands of people, each summer, closely observe the emergences of 1.5 million Mexican free-tailed bats at the Congress Avenue Bridge in Austin, Texas, and in over 20 years, no one has been attacked or harmed. In fact, though Austin, San Antonio, and several other Texas Hill Country towns likely support the highest bat densities in America, they have recorded no human cases of bat-transmitted rabies.

Are bats likely to cause rabies outbreaks in other wildlife or in domestic animals?

There is no evidence that rabies from bats has triggered outbreaks in other animals. It occasionally does spill over into other species, causing individual animals to

die, but even this is apparently rare. Despite the fact that numerous carnivores gather to feed on the 20 million Mexican free-tailed bats at Bracken Cave, Texas, no outbreaks of rabies are known from this source. No transmission from bats to dogs is known to have occurred, though rare cases of transmission to cats have been documented. The presence or absence of bats is irrelevant to the fact that all dogs and cats should be vaccinated.

What can be done to prevent rabies transmission to humans?

By far the most important prevention is dog and cat vaccination. Also, children should be especially warned never to handle any unfamiliar animal. Explain that wild animals that can be touched may be rabid and dangerous. Ninety to 95% of sick bats are not rabid, but taking a careless chance on being bitten could prove fatal. Any animal bite should be reported immediately to a family physician or public health professional for evaluation as a possible rabies exposure.

The U.S. Centers for Disease Control and Prevention recommend pre-exposure vaccinations for people who are at high risk of exposure, such as rabies researchers, veterinarians, field biologists, and animal rehabilitators. Vaccines currently available include Imovax (HDCV--a human diploid cell vaccine) and Rabavert (PCEC--a purified chick embryo cell vaccine). Vaccinations are administered on days 0, 7, and 21 or 28. Dosage and route of administration varies depending upon the vaccine used. For those at continued risk of exposure to rabies, a booster dose of vaccine or serology may be necessary at intervals of 6 months to 2 years.

What are the symptoms of rabies?

Rabies causes fatal inflammation of the brain or spinal cord. Symptoms most often develop about 10 days to seven months after infection (some cases take years to develop), and death follows 2-12 days after symptoms appear. Early symptoms in humans include pain, burning, and numbness at the site of infection. Victims complain of headaches, inability to sleep, irritability, muscle spasms and difficulty swallowing. Convulsions may occur, followed normally by death.

Rabies is often referred to as hydrophobia because

victims fear swallowing. Drinking or eating can bring on muscle spasms of the throat. The fear of swallowing also accounts for saliva accumulation referred to as "foaming" at the mouth. Infected animals may be either agitated and aggressive or paralyzed and passive. Dogs, cats, and other carnivores often become aggressive and try to attack humans and other animals, but bats are typically passive. Bats normally bite only in self-defense if handled, and aggressive behavior is rare even when rabid.

How should potential exposures to rabid bats be evaluated and treated?

Any mammal that bites a human should be tested for rabies as soon as possible, and post-exposure treatment should begin immediately unless it is confirmed negative. Bat bites are typically felt and detected at the time. Visual examination for bite marks is unreliable. If visible at all, bites may appear only as a single tiny puncture or scratch. Most punctures are a millimeter or less in diameter, and most bat-inflicted scratch marks are no more than a few millimeters long. Extenuating circumstances can make detection difficult. If a lost or sick bat hides in bedding, it could be inadvertently pinched during one's sleep, bite, and leave without detection. Also, people hauling in firewood or moving outdoor lumber piles may accidentally poke and be bitten by a bat without noticing. These are obviously remote possibilities, though wearing gloves when moving wood piles could provide protection.

If a young child or a mentally incapacitated person is found alone with a bat in the same room and the possibility of a bite cannot be eliminated, post-exposure treatment should be considered unless prompt testing of the bat can rule out infection. When questioning about possible exposure, it is essential first to calm fears of painful shots. For the majority of patients, the post-exposure shots are less painful than tetanus vaccinations. Also, persons who wake up with a bat in the same room where they have been sleeping are advised to submit it for testing, especially if the bat is unable to fly or seems weak.

What is the recommended treatment for a known or suspected rabies exposure?

Modern rabies treatment is highly effective and relatively painless. Post-exposure rabies prophylaxis should begin as soon after exposure as possible. According to the Centers for Disease Control and Prevention, exposed humans who have not previously been vaccinated against rabies should receive an initial intramuscular injection of Human Rabies Immune Globulin (HRIG), twenty international units per kilogram body weight or nine international units per pound of body weight in total. If anatomically feasible, the full dose of HRIG should be thoroughly infiltrated in the area around and into the wound(s). Any remaining volume should be administered intramuscularly at a site distant from vaccine inoculation. The HRIG is followed by a series of five 1.0 ml of either Imovax (HDCV--a Human Diploid Cell Vaccine), or Rabavert (PCEC--a purified chick embryo cell vaccine). The vaccination series is given on days 0, 3, 7, 14, and 28. Vaccines are administered intramuscularly in the deltoid region. Persons who have previously received rabies vaccination should receive two 1.0 ml IM doses of either of the three vaccines listed above, one on day 0, the second on day 3.

Where can the vaccine be obtained?

Rabies post-exposure vaccinations can be obtained from hospitals, emergency clinics, and some doctors. If unavailable locally, vaccines and human rabies immunoglobulin (HRIG) can be obtained as follows: 1) Imovax (HDCV) and Imogan (HRIG) from Pasteur Merieux Connaught at 1-800-822-2463; 2) Rabavert (PCEC) from Chiron at 1-800-244-7668; and 3) Bayrab (HRIG) from Bayer at 1-800-288-8370. Additional information is available from the Division of Viral and Rickettsial Diseases, U.S. Centers for Disease Control and Prevention at (404) 639-1075 during working hours, or at (404) 639-2888 on nights, weekends, or holidays.

Additional References

- Bats and Rabies: A Public Health Guide, A Special Publication of the U.S. Department of Health and Human Services. 1998.
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