Animal Bites: Assessing Risk for Rabies and Providing Treatment

Mark Rapoport

Pediatrics in Review 1997;18;142
DOI: 10.1542/pir.18-4-142

Comment: Since Dr. Shliozberg wrote her *In Brief*, the use of terfenadine for treatment of allergic rhinitis has become controversial. Particularly when levels in the blood become elevated by overdosage or because of drug interactions, terfenadine has been associated with prolongation of the QT interval, resulting in rare instances in ventricular dysrrhythmia and even death. Other drugs that can contribute to increased concentrations of terfenadine in the blood include erythromycin, clarithromycin, ketoconazole, and itraconazole. Because terfenadine is metabolized by the liver, impaired hepatic function also can lead to elevated blood levels.

Henry M. Adam, MD
Editor, In Brief

IN BRIEF

Animal Bites: Assessing Risk for Rabies and Providing Treatment

Rabies Virus. Fishbein DB, Bernard KW. In: Mandell C, Bennett J, Dolin R, eds. *Principles and Practices of Infectious Diseases.* New York, NY: Churchill Livingstone; 1995:527–543

Rabies Prevention—United States, 1991. Centers for Disease Control. *MMWR.* 1991;40:RR–3

Human Rabies—New York, 1993. Centers for Disease Control. *MMWR.* 1993;42:41; 799, 805

Control of Communicable Disease Manual. Beneson A. Washington, DC: APHA; 1995:382–390

Rabies kills relatively few persons in the United States, but more than 30,000 people worldwide die each year from the disease. Three facts govern our approach to rabies: 1) It is a disease uniformly fatal once symptoms appear; 2) We have a low-toxicity, virtually 100% effective vaccine; and 3) We lack a definitive test for actual exposure (except when the biting animal is available for testing).

Rabies virus can infect any mammalian species. A given strain may infect one species predominantly, but can be passed into and by any other species. Periods of communicability and incubation are defined only for domestic dogs and cats and for some farm animals. For all other animals suspected of having rabies after biting, euthanasia and subsequent testing are required to rule out risk of human disease. In addition to the human vaccine, there are vaccines available for dogs, cats, and some other domestic species.

A raccoon-associated rabies epidemic is present in much of the eastern part of the United States. Outbreaks associated with foxes, coyotes, and dogs exist elsewhere. Rabies spread by bats is present across most of the country. Although most bites in which rabies exposure is suspected are from terrestrial mammals, either domestic or wild, these rarely lead to death. The threat generally is appreciated (even if not immediately at the time of exposure), and prophylaxis almost always is given. By contrast, bat bites and scratches often are unnoticeable. It is not surprising that bat strains of the virus have been the cause of most recent human deaths from rabies, including two since 1993 in a single hospital in Westchester County, New York. In each of these cases, bats were known to live near the child's home. However, despite extensive questioning of family, friends, and other acquaintances, no history of exposure could be elicited. The presumption was that the exposure occurred but went unnoticed. In another recent pediatric case of rabies, contact was observed between child and bat, but because no mark was evident on examination, no treatment was sought; clinical rabies and death ensued. Based on this case, some health department officers now administer prophylaxis if contact cannot be ruled out, regardless of the absence of a noticeable wound from teeth or claws. Hypothetically, a person who wakes up to find a bat in his or her room and watches it depart without contact would be immunized because the person could have been asleep for some time with the bat in the room and might have been exposed unknowingly.

Virtually all rabies deaths have come from direct bites, but we know from exposures to aerosols in caves and laboratories that mucous membranes and respiratory epithelium are potential entry points and must be considered. The initial response to a potential exposure includes:

1. Advice on immediate wound care (vigorous soap and water washing).
2. Retention of the animal responsible, dead or alive, with head intact.
3. An inventory of all persons or pets exposed.
4. A description of the exposure (bite, saliva, neural tissues), subsequent secondary exposures, hand washing behavior (to rule out subsequent inadvertent exposure to mucous membranes), and information on the animal (owner, immunization status, past behavior, and circumstances of exposure).
5. An immediate report to local health authorities.
6. An assessment by a physician or emergency department.

Decisions to immunize primary (and secondary) contacts, sacrifice or quarantine animals, await laboratory testing results, and alert the public in search of related but unreported additional exposures are very complex. These decisions should be made by the local or state public health agency, which usually is available 24 hours a day and has access to additional expertise from state health departments and the Centers for Disease Control and Prevention. Pediatric exposures may present two additional nuances. First, parental refusal of medically indicated vaccination potentially requires the intervention of child protective services. Second, the relatively unreliable memory of younger children must be considered in the decision-making.

The potential for human-to-human spread may become an issue, usually in the context of family members and health-care workers in contact with a case before rabies was diagnosed. Although human-to-human spread has been documented only from corneal transplants, current practice has extended to assessing and often treating for exposures that present largely theoretical risks. For instance, in Westchester, multiple persons were immunized because of contact with fluids from one of the deceased victims, whose rabies was diagnosed only at autopsy. Uncertainty over how long virus can survive in droplets and on fomites complicates decision-making. Fear of the disease, both rational and irrational, has led to a "defensive medicine" approach that virtually guarantees the immunization of many persons not truly exposed. In truth, it is the rare clinician or public health official who wishes to (or can) maintain a hard line in refusing vaccine if desired by an anxious patient or patient's parents.

Mark Rapoport, MD, MPH
Medical Director
Medicaid Programs
Oxford Health Plan
New York, NY

Comment: When there is a possibility of exposure to rabies, the decision of whether to initiate prophylactic treatment often is terribly difficult. Some situations clearly warrant immediate intervention (a bite by a dog or cat suspected from its behavior to be rabid); in others, it is equally clear that no therapy against rabies is needed (a bite by a rodent or a rabbit). In many cases, however, the appropriate action (or inaction) will not be obvious at all. Take Dr. Rapoport's advice and consult with a public health official.

Once the decision is made to intervene, postexposure treatment should begin with local wound care to minimize the risk of virus gaining access to neural tissue. The bite or scratch should be flushed copiously and cleaned thoroughly with soap and water. If possible, avoid suturing, and remember to consider the need for tetanus vaccination. Prophylaxis against rabies should combine active immunization (with either the human or rhesus diploid cell vaccine) and passive protection (with rabies immune globulin).

Henry M. Adam, MD
Editor, In Brief

Earning CME Credit-Completing the PIR Quiz

The American Academy of Pediatrics (AAP) is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to sponsor continuing medical education for physicians. *Pediatrics in Review* (*PIR*) was planned and produced in accordance with the ACCME Essentials.

The AAP designates this activity for up to 38 hours in Category 1 of the Physician's Recognition Award of the American Medical Association (3 hours per completed print issue of *PIR* and 2 hours per completed compact disc issue of *PIR*).

PIR Quiz: A short quiz can be found at th end of each article in *PIR*. Use the *PIR* Quiz Card (bound into the January issue) to record your answers. Each question has a single best answer. The answers to the questions appear on the inside front cover of each issue.

1997 Credit Deadline: *February 28, 1998.* If you want to receive CME credit in 1997, the *PIR* Quiz Card must be received in the PREP Office by February 28, 1998. Credit reply material received after February 28, 1998, will be applied to the following year.

Expiration of Credit: *December 31, 1999.* Credit for completing the 1997 PIR will be awarded for up to 2 years. Credits will be posted to the year in which they are submitted.

Verification of Credit will be mailed by: *April 30, 1998.* You will receive a complimentary transcript by April 30, 1998, containing a summary of CME credits earned in 1997 through AAP programs. If you require a transcript at any other time of the year, there will be a fee of $25 for processing.

Mail form to: *American Academy of Pediatrics - PREP Office, 141 Northwest Point Boulevard, PO Box 927, Elk Grove Village, IL 60009-0927*

PREP Education Award: The AAP PREP Education Award recognizes Academy Fellows and Candidate Fellows who earn a minimum of 150 AAP-approved CME credits over 3 consecutive years. The Award will be mailed July 1998 to all individuals who qualify. To qualify for the PREP Education Award, an Academy Fellow or Candidate Fellow must:

- Earn a minimum of 75 credit hours through participation in PREP or PREP: The Course, and
- Earn the remaining credit hours (75 hours) through other Academy-sponsored or -approved CME activities, including AAP Spring Session of Annual Meeting, AAP CME courses, ACQIP, Pediatric UPDATE Audiocassette Tape Program, or other AAP-approved courses.

Other Organizations Granting Credit: *PIR* has been approved for credit as follows:

- *American Academy of Pediatrics* (AAP); up to 38 hours of credit toward the AAP PREP Education Award
- *American Osteopathic Association* (AOA); up to 12 hours, Category 2-B
- *National Association of Pediatric Nurse Associates and Practitioners* (NAPNAP); up to 38 contact hours.
- *Canadian Paediatric Society* has approved PREP as one method for pediatricians to demonstrate maintenance of competence (MOCOMP)
- PREP has been reviewed and accepted by the *American Academy of Family Physicians* (AAFP) for up to 38 Prescribed hours. Term of approval begins January 1997. Enduring materials are approved for 1 year with the option to request renewal.

Animal Bites: Assessing Risk for Rabies and Providing Treatment

Mark Rapoport

Pediatrics in Review 1997;18;142
DOI: 10.1542/pir.18-4-142

PIR QUIZ

1. Infection with *Mycoplasma pneumoniae* is *best* characterized by:
   A. A reservoir in domestic pets.
   B. Infrequent disease among infants younger than 18 months.
   C. Predominance in spring and summer.
   D. Transmission by an arthropod vector.
   E. Uncommon intrafamilial spread.

2. The extrarespiratory manifestation most *likely* to occur in a previously healthy 10-year-old boy who has *Mycoplasma pneumoniae* pneumonia is:
   A. Aplastic anemia.
   B. Chronic arthritis.
   C. Macular exanthem.
   D. Myocarditis.
   E Transverse myelitis.

3. *Mycoplasma pneumoniae* pneumonia is *least* likely if chest radiography reveals:
   A. Bilateral disease.
   B. Cavitation.
   C. Lobar consolidation.
   D. Multifocal disease.
   E. Pleural effusion.

4. A 10-year-old girl has had a slightly productive cough for the past 2 weeks. She is afebrile and not toxic. Auscultation detects a few crackles in the left lower lobe. Chest radiography reveals a reticular infiltrate. You suspect *Mycoplasma pneumoniae* infection. The *best* current choice of diagnostic test is:
   A. Acute serum complement fixation.
   B. Bacterial culture.
   C. *Mycoplasma*-specific immunoglobulin M (IgM).
   D. Serum cold agglutinins.
   E. Sputum Gram stain.

5. You confirm that pneumonia in a previously well, nontoxic, 12-year-old boy is caused by *Mycoplasma pneumoniae*. The *most* cost-effective choice of therapy is:
   A. Amoxicillin.
   B. Azithromycin.
   C. Ciprofloxacin.
   D. Clarithromycin.
   E. Tetracycline.

ERRATUM

Previous articles* in *Pediatrics in Review* have stated that rabies is a uniformly fatal disease, which, of course, is what most of us were taught. However, Dr Thomas Weis points out that the 1997 *Red Book* states, “only seven patients with human rabies have survived with intensive, supportive care....” As Dr Weis states, “Though the odds are small, each rabies victim should be given the chance of living.”

*Garcia VF. Animal bites and *Pasturella* infections. *Pediatrics in Review.* 1997;18:127–130

Rapoport M, Adam HM. Animal bites—assessing risk for rabies and providing treatment. *Pediatrics in Review.* 1997;18:142–143

Cheng TL. Rabies vaccine. *Pediatrics in Review.* 1998;19:176