

Rabies

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Introduction

Rabies is a disease that is caused by a virus that affects the nervous system of warm-blooded animals and, with rare exceptions, is fatal. Except for selected island countries and states (Hawaii), rabies occurs world-wide. As a fatal disease, rabies is considered not treatable, but is preventable by immunization of pets and humans with great risk of exposure (veterinarians and technicians for example). Post exposure treatment of humans with known exposure to rabies virus is commonly undertaken.

Transmission

The rabies virus does not persist well in the environment. Sunlight, warm temperatures, drying, heat and common disinfectants all destroy the infective ability of the rabies virus.

All species of warm-blooded animals are susceptible but there are differences in susceptibility. Opossums and birds are among the most resistant species. Skunks, wild canines (foxes, wolves, coyotes, wild dogs, etc.), raccoons, bats, and cattle are among the most susceptible. Dogs, cats, horses, sheep, goats, primates, and humans are intermediate in susceptibility.

Wild animals are the primary source of maintaining rabies (termed reservoirs) in many parts of the world, but domestic animal pets are the principal source for transmission of rabies to humans. When rabies in dogs and cats is controlled, the occurrence of rabies in humans is reduced to a very low level. This was noted following implementation of rabies vaccination programs for dogs and cats beginning in the early 1950s.

Rabies virus must contact the nerve endings and enter nerve fibers before infection occurs. This is achieved primarily through contact of infected saliva from a rabid animal with nerve endings or damaged nerve fibers as a result of the bite from a rabid animal. Transmission of rabies can also occur through contamination of a fresh wound with saliva containing rabies virus, rabies virus making contact with the conjunctivae (pink tissues around eyes/inside eyelids) or through the nasal passages.

The time period it takes for the disease to develop (incubation period) may vary from 3 to 8 weeks usually, but it may occur in as short as a week or more than a year. The location of the bite/exposure and the amount of virus at exposure are the two most important factors affecting incubation period. Bites that occur on the face, head, and neck result in shorter incubation periods. After infection occurs, the virus moves up the nerve fibers until it reaches the spinal cord and brain. After the virus reaches the brain it moves down through nerve fibers into the salivary glands, which allows the virus to be shed in the saliva, leading to further transmission.

Clinical Signs (Symptoms)

Three clinical stages of rabies have been defined; prodromal, excitative and paralytic.

Prodromal Stage - Characterized by a change in behavior and is indicative that the rabies syndrome is to follow. This change is the basis for the expression 'mad dogs and friendly foxes.' Wild animals lose their fear of humans and may be observed during the day in abnormal locations. For example, animals that are usually active at night are seen during the day in areas they would not usually be seen. Friendly, affectionate pets become apprehensive, unusually alert to changes in their surroundings and may hide out of fear. This period lasts for 1-3 days.

Excitative /Hyperreactive Stage - In this stage animals show hyperreactivity to external stimuli or are easily excited and may attempt to bite anything close by, including wood, metal, fences and they may snap at imaginary objects. this stage is responsible for the association of rabies with a 'mad dog.' If these signs are prominent the animal is considered to have the 'furious' form of rabies. Some animals may not display these signs (or are of short duration) or may be oblivious to their surroundings, almost in a state of stupor, termed 'dumb' form of rabies. The excitative stage may be non-existent (in dumb rabies) or may last as long as 3-4 days.

Paralytic Stage - The final form of the disease. The viral damage to the nerve tissue results in paralysis and gradual incoordination of the back legs. This is often the first sign of the paralytic stage. Animals with unexplained paralysis should be regarded as possibly rabid, even though no previous signs of rabies has been seen. Paralysis of the muscles involved in swallowing are responsible for the drooling of saliva and inability to swallow (foaming at the mouth). The paralytic stage may last for 1-2 days and is followed by death due to respiratory arrest. Death from rabies in domestic animals usually occurs within 2-7 days after the onset of visible symptoms.

Diagnosis

Rabies should be suspected on the basis of symptoms. Confirmation depends upon finding the rabies virus in portions of the brain or brainstem. Unfortunately, this requires that the animal be euthanized and the brain tissue to the appropriate laboratory that provides the testing. The test is better than 99% accurate in diagnosing rabies. If the rabies virus is not in the brain, it is concluded that there will be no virus in the saliva.

Treatment

It is not recommended to treat domestic animals for rabies due to the risk of human exposure and the fact that the disease is usually fatal anyway. The treatment in exposed humans consists of a series of 'vaccination' injections given on a set schedule over several weeks.

Prevention

It is preventable by vaccinating dogs and cats as well as by controlling stray animal populations. Widespread vaccination has been one of the most effective programs in decreasing the occurrence of human rabies. These programs began in the early 1950s and cases of human rabies dropped from 40/year in 1940, to only 1 or 2/year in the 1960s. During the same period the cases of rabies in dogs declined from more than 8,000/year to about 300/year in the 1960s.

Excellent rabies vaccines are currently available in the United States for use in dogs and cats. They contain inactivated (killed) virus and are safe and effective. It is recommended that dogs and cats are vaccinated at 4 months of age and then provided with a yearly booster. Boosters are then given at regular intervals thereafter.

Management of Dogs and Cats That Have Bitten a Human

A dog showing signs of nervous system disease (described earlier) at the time it bites a human should undergo euthanasia immediately and have the brain examined for rabies virus to determine whether the bitten person was possibly exposed to rabies. A stray animal exhibiting neurological signs that has bitten a person should be euthanized and have the brain submitted. A stray animal that appears to be normal and has bitten should be placed in an appropriate facility for observation of the symptoms of rabies. Sometimes it may just be a frightened pet that has escaped and not a rabid animal. Always exercise caution approaching stray animals due to their uncertain disease status. Obtain professional animal control assistance in capturing the animal. If the stray bites you and escapes consult your physician regarding your possible exposure to rabies and the appropriate preventative treatment.

Healthy dogs or cats that are owned pets and have bitten a person are required by law to be confined (at home or in an appropriate facility) for 10 days after the bite and observed for the signs of rabies. The purpose of the 10 day observation is to determine whether the bitten person was exposed to rabies. This is based on the fact that dogs and cats do not shed rabies virus for more than a few days before the onset of symptoms. Six days before the onset of symptoms is the earliest that the virus has been found in the saliva of either dogs or cats. Therefore, if the dog or cat remains healthy for 10 days after the bite, there was no exposure. This is the rationale in the 'rabies observation' protocol. The biting animal is placed in home confinement for 10 days, examined by a veterinarian on day 1 (also on day 5 if unvaccinated) and on day 10. If no signs of rabies are noted upon examination the animal is released from confinement. Unvaccinated animals would then be vaccinated. If the animal was killed/died during this period, the brain tissue would need to be submitted to detect for rabies. If the animal escaped, the authorities would need to be notified so that the person that was bitten could be properly treated for rabies exposure. Would YOU want to take a chance if the dog that bit you suddenly ran away and there was no way to be sure if it had rabies or not? This all may appear to be an inconvenience for the owner of the biting dog, but these laws are in place to protect others. This is truly a responsibility of pet ownership.

Management of Dogs and Cats Exposed to Rabies

Dogs and cats up to date on their rabies vaccinations and bitten by a proven rabid animal or by a wild animal with the potential to carry rabies should be revaccinated immediately and observed for 90 days. It is recommended that unvaccinated dogs or cats that have been bitten by a rabid animal should undergo euthanasia or be confined in strict isolation for 6 months in an approved facility. However, this is risky due to the potential for human exposure over this period. The dog or cat should be vaccinated at the 5th month of isolation, and if healthy at the end of six months be released to the owners. The purpose of these requirements for management of cats and dogs exposed to rabies is to prevent secondary exposure of other animals or humans if the bitten dog or cat should develop rabies as result of the known exposure.

Wild Animals

If you observed a wild animal displaying neurological signs contact the animal control officer in your area or someone licensed to handle wildlife. Do not expose yourself or your family to the risk of rabies. If you were bitten by such an animal it is essential that the brain tissue be examined. If your vaccinated dog/cat got in a tussle with a wild animal that has the potential to have rabies and has escaped obtain revaccination immediately as mentioned earlier. If unvaccinated the problem is more complex as discussed earlier. Why take any chances? Have your pet vaccinated to minimize the risks. Outdoor cats, due to their 'roving' lifestyle, are at an even greater risk to contract rabies. If you let your cat outdoors it is essential that they are vaccinated. It is the law, by the way, that all dogs and cats are to be vaccinated against rabies anyway!

If your dog or cat fought with and killed an animal that has the potential to carry rabies, seek help either from animal control or a veterinarian. They would be able to prepare the brain tissue properly so it could be sent to the laboratory and evaluated for the presence of rabies.

Summary

As can be determined from the preceding discussion, rabies is an extremely dangerous disease and is a disease that is a threat to those who do not take precautions. Prevent the disease in your pets by having them properly vaccinated and given booster vaccinations at regular prescribed intervals. Limit your/your pets exposure to the disease by taking caution around stray dogs/cats. Although the risk that they may be rabid is low can you afford to take that chance? Also avoid approaching wildlife that could carry rabies (especially if they are showing neurological signs) unless you have consulted with or a skilled professional is involved. These animals can be a source of infection for man and beast. Remember - prevention is the key.