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Rabies Risk from Bear Attacks

Introduction

Rabies is caused by a virus that can potentially infect all mammals, including humans. Rabies is enzootic (always present) among fox populations of northern and western Alaska.^{1,2} Additionally, since 1971, rabies has been detected in other animals, including river otters, caribou, wolves, coyotes, reindeer, cats and dogs. Rabies has yet to be documented in any bear in Alaska.

Historical and experimental data

No accounts of rabid bears are included in reviews of Alaska wildlife diseases recorded in the 1950s and 1970s.^{3,4} In fact, Rausch demonstrated that brown and black bears experimentally infected with rabies appeared to be somewhat resistant to infection with the fox strain, requiring a relatively higher infectious dose of virus to become ill compared with dogs.⁵

Alaska bears tested for rabies

In the past 35 years, the State Virology Laboratory in Fairbanks has evaluated a total of 20 bears for the presence of rabies virus; **none** have tested positive. All of the four black bears that were evaluated had caused human injuries (one fatality). Of the eight brown bears submitted for testing, three had caused human injuries (two fatalities). Of the eight polar bears submitted for testing, two had caused human injuries (one fatality).

Testing of any animal for rabies most commonly is performed on brain tissue collected from a dead animal. Because rabies virus is shed in the saliva, salivary samples can also be evaluated as was the case for one of the brown bears listed above that was bitten by a rabid arctic fox while being tranquilized and fitted with a radio collar. The following spring this bear was recaptured; saliva samples taken tested negative for rabies.

Bear attacks on humans

Bear attacks on humans are not reportable to public health authorities; however, the Section of Epidemiology maintains a registry of human injuries from bear attacks (Figure 1).⁶

Bear rabies outside of Alaska

Rabies has been documented in seven black bears in several Canadian provinces (Alberta, Ontario, Quebec, and Northwest Territories),⁷ as well as in a bear each in Arizona and New Jersey.^{8,9} Rabid bears in Canada were detected early in the season suggesting that there may be a link between hibernation and timing of disease; i.e., foxes may have bitten bears while they hibernated or the stress of coming out of hibernation could have induced latent virus from an exposure prior to hibernation. Rabies has been documented in a single polar bear in Canada.¹⁰ Although there are no reports of clinical rabies in brown bears, rabies neutralizing antibody was documented in one brown bear.¹¹ The titer is thought to have resulted from ingestion of an oral wildlife rabies vaccine and not from actual infection with the rabies virus.

Rabies post-exposure prophylaxis for bear exposures

Assessing the need for rabies post-exposure prophylaxis (PEP) following a bear attack is similar to assessing the need for exposures to other potentially rabid domestic or wild animals. However, given the experimental Alaskan data that suggest bears require an infectious dose above the usual quantities of virus excreted in the saliva of foxes (the reservoir species), rabies PEP following a bear attack is rarely recommended.

Recommendations for rabies PEP are based upon several factors; some of which are listed below.

- Did the incident occur in a known rabies enzootic area? Rabies virus is transmitted via saliva; however, once the virus is desiccated, it is no longer viable. Rabies is **not** transmitted by contact with the blood, urine or feces of a rabid animal. Rabies PEP is not usually indicated for persons exposed to animals in areas of Alaska where rabies has not been documented.
- Was the animal behaving in an unusual manner? Rabies PEP is not usually indicated for persons who were bitten or attacked by an animal that was provoked. Provocation could be an obvious action, e.g., walking between a sow and her cub, or a more subtle one, e.g., walking past a chained dog that is guarding his owner's house.

Incidents where persons may have been exposed to rabies are considered **public health emergencies**. Section of Epidemiology staff are available 24-hours a day for consultation, for assistance in submitting an animal head for testing, or for obtaining rabies PEP. Please call (907) 269-8000; or (800) 478-0084 after hours.

References

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