The Human Risk Factor: Rabies

Background
The number of human rabies cases has been on the decline; however the disease continues to be a source of great unease for epidemiologists, veterinarians, and physicians. Wunner (2005) stated that “the threat of rabies spreading from wildlife reservoirs to and among domestic and wildlife animals as well as to humans remains a major public health concern” (p. 1).

The United States, unlike most European countries, is not rabies free; therefore those living in the U.S. and in South America are at risk for exposure to this deadly virus. Major medical advances and on-going research in this field of study are improving the understanding of rabies pathogenesis (Jackson, 2006).

Human Rabies
Despite the fact that there is a large number of rabid wildlife in the United States, cases of human rabies are fairly uncommon because of postexposure treatment regiments and strict vaccine laws for domestic animals (Robbins, Eidson, Keegan, Sackett, & Laniewicz 2005).

Exposure and Transmission
Wildlife carriers of the virus such as bats (see Figure 1) and raccoons are major transmitters of rabies to humans (Wunner, 2005). The figure illustrates the number of people exposed to rabies by bats and how the disease seems to be transmitted. Other modes of transmission for human rabies, presented by Robbins et al. (2005) and the CDC (2007) include contact with nervous system, mucous membranes, and saliva deposits. Deep scratches and contamination of wounds by infected fluids is another example.

![Figure 1. Number of persons exposed to bats by most frequently reported incident types, New York State, 1998–2002.](image)

Clinical Signs of Infection
The incubation time for the virus typically lasts a few weeks to even a couple of months depending on the host and strain of rabies (Jackson, 2006). Once the symptoms appear it is too late for treatment and the disease becomes fatal. Rabies is a progressive disease where the normal time frame from onset of symptoms to death ranges about three to eight days (Lackay Kuang, & Fu, 2008). Clinical signs and warning symptoms of rabies include flu-like symptoms, behavioral change, and vicious and erratic manner.

After the infected animal starts showing symptoms, Jackson (2006) states that the “rabies virus spreads to the central nervous system…the virus infects neurons in multiple brain regions” (p. 267). Death of the animal or human is usually brought on
by respiratory failure and acute encephalomyelitis.

**Postexposure Prophylaxis Treatment**

Even though rabies is considered fatal after symptoms are first noticed, if caught early, death can be prevented by immediately beginning a treatment regiment called Postexposure Prophylaxis (PEP). PEP includes an initial dose of rabies immune globulin (RIG) followed by a series of five doses of rabies vaccine given in a 1 month period (Robbins et al., 2005). According to the CDC (2007), the RIG injection is given “to provide immediate antibodies until they [the recipient] respond to the vaccine by actively producing antibodies of their own” (p. 3). Apart from the injections, the last facet of the PEP treatment is wound cleansing. This step is important because it rinses and irrigates the wound of any infection.

**Conclusion**

As long as wildlife, domestic animals, and humans cohabitate, rabies will continue to be a health concern for animals and humans alike. Rabies continues to be an important virus to study because with modern medical breakthroughs happening every day, a cure for this fatal disease could be discovered soon.

It is important to study this disease and continue research in this field because of the many advances in medicine. While the cases are far and few, much can be learned from them. New treatments and possible cures for this deadly disease are located within these cases.

**Audience**

This research brief is for physicians, epidemiologists, and veterinarians to update their knowledge of rabies and human cases attributed to the disease. Those reading the brief are likely in the medical field.

**References**


