

Rabies: A Deadly Disease That Can Be Prevented

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Abstract

Rabies is a fatal but preventable viral zoonotic disease that affects humans and other mammals. Caused by viruses of the genus *Lyssavirus*, it is most commonly transmitted through the saliva of infected animals, particularly through bites. Once clinical signs develop, rabies is almost invariably fatal; however, prompt wound washing and appropriate post-exposure prophylaxis can prevent disease following exposure. Dogs remain the major source of human rabies, making mass dog vaccination a central component of rabies prevention and elimination. This article discusses rabies transmission, clinical progression, immediate measures following animal exposure, post-exposure prophylaxis, animal vaccination and responsible pet ownership. It also highlights the importance of the One Health approach, which integrates human healthcare, veterinary services, public-health surveillance and community awareness to reduce transmission and support the global goal of eliminating dog-mediated human rabies.

Keywords: Rabies; *Lyssavirus*; Zoonotic disease; Dog-mediated rabies; Animal vaccination; Post-exposure prophylaxis; Rabies immunoglobulin; One Health; Public health; Disease prevention

Rabies is one of the oldest and most feared zoonotic diseases known to humans. It is a viral disease that affects the central nervous system and can infect humans as well as other mammals. Despite being almost invariably fatal once clinical signs appear, rabies is preventable through vaccination and timely post-exposure treatment. This makes rabies an important example of how human health, animal health and environmental factors are closely interconnected.

What is rabies?

Rabies is caused by viruses belonging to the genus *Lyssavirus*. The infection is usually transmitted through the saliva of an infected animal, most commonly through a bite. Scratches contaminated with saliva and contact of infectious saliva with broken skin or mucous membranes can also result in exposure. According to the World Health Organization

(WHO), rabies occurs in more than 150 countries and territories, particularly in Asia and Africa. Dogs are responsible for approximately 99% of human rabies cases. Children are especially vulnerable because they may not recognize the danger associated with approaching unfamiliar animals.

Why is rabies so dangerous?

The rabies virus initially replicates near the site of infection and subsequently travels through peripheral nerves toward the central nervous system. Once the virus reaches the brain and clinical disease develops, rabies is almost invariably fatal.

Early symptoms may include fever, weakness, headache and discomfort or unusual sensations around the site of the bite. As the disease progresses, neurological signs can develop, including agitation, confusion, difficulty swallowing, excessive salivation,



hallucinations and paralysis.

The important message is that a person exposed to rabies does not have to develop the disease. Prompt and appropriate post-exposure prophylaxis (PEP) can prevent the virus from reaching the nervous system.

What should be done after an animal bite?

A suspected rabies exposure should be treated as a medical emergency.

The first and immediate step is to wash and flush the wound thoroughly with soap and plenty of running water for approximately 15 minutes. An appropriate virucidal antiseptic may then be applied. The wound should subsequently be assessed by a healthcare professional for the need for rabies vaccination and, when indicated, rabies immunoglobulin or monoclonal antibodies.

WHO classifies exposures according to their severity. Minor scratches or abrasions without bleeding can require vaccination, while transdermal bites or scratches and contamination of broken skin or mucous membranes with saliva are severe exposures requiring vaccination and, when indicated, rabies immunoglobulin.

Traditional remedies such as applying chilli, herbs, oil or other irritants to a bite wound should be avoided because they do not prevent rabies and may further damage the wound.

Prevention starts with animals

Human rabies prevention cannot depend only on treating people after bites. The most effective long-term strategy is to control rabies at its animal source.

Mass vaccination of dogs is a key component of rabies elimination. WHO and the World Organisation for Animal Health (WOAH) identify high vaccination coverage in dog populations as an essential component of controlling dog-mediated rabies. Vaccinating at least 70% of dogs in endemic areas is the commonly cited population-level target for interrupting transmission.

Responsible pet ownership also plays an important role. Dogs and cats should receive appropriate rabies vaccination according to veterinary recommendations, and owners

should avoid allowing pets to roam unsupervised or interact unnecessarily with potentially infected animals.

The importance of the One Health approach

Rabies demonstrates why human health and animal health cannot be considered separately.

Veterinarians are important in rabies surveillance, diagnosis, animal vaccination, outbreak investigation and public education. Medical professionals provide PEP and manage exposed individuals, while public-health authorities coordinate surveillance and prevention programmes.

This collaboration represents the One Health approach, in which human, animal and environmental health sectors work together to prevent disease. WHO and its partners have adopted a global goal of ending human deaths from dog-mediated rabies by 2030.

Awareness can save lives

Many rabies deaths can be prevented if people know what to do after an animal bite. A common misconception is that a wound should be treated with household or traditional substances, or that vaccination can be delayed until symptoms appear. Neither approach is appropriate.

The simple message to remember is to wash the wound immediately, avoid applying harmful substances, and seek medical care without delay. Follow the recommended post-exposure prophylaxis (PEP) schedule, and make sure dogs and other animals are vaccinated according to veterinary advice.

Rabies remains a serious public-health challenge, but it is also a disease for which effective prevention tools already exist. Eliminating dog-mediated human rabies will require sustained dog vaccination, accessible PEP, reliable surveillance, responsible animal ownership and continuous community education.

Rabies therefore reminds us of an important principle of public health: prevention is possible when human and animal health systems work together.

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