

ELIMINATING RABIES WITH ONE HEALTH APPROACH

Mrinmoyee sarma¹, Balivada Deepika¹, Monoshree Sarma¹, Manoj Kumar Kalwaniya², Anisetty Shilpa sree¹

¹Institute of Veterinary Science and Animal Husbandry, Siksha 'o' Anusandhan Deemed to be University, Bhubaneswar, Odisha, ²Arawali Veterinary College, Sikar, RAJUVAS, Rajasthan

Abstract

Rabies is highly fatal yet preventable zoonotic disease cause by Lyssa virus under the family Rhabdoviridae. Rabies is prevalent in more than 150 countries including India. Dogs serve as the primary source of human rabies death contributing up to 99% of rabies cases transmissible to man. Globally, rabies causes 59,000 human deaths annually. In continents like Asia and Africa, the burden of the disease is influential resulting in thousands of fatalities each year. About 40% of the victims are children under the age group of 15 years. Man acquires the infection primarily through bite or scratch of a rabid animal or when the virus laden saliva comes in contact with abraded skin or mucous membrane of eye or mouth. The incubation period of rabies ranges from 1-3 months. In few cases, it might vary from 10 days to several years. There are two classical forms of rabies based on the route the virus takes to reach the brain. The furious form of rabies is characterised by hyper excitability, increased muscular tone, excessive salivation, dilatation of the pupil, dramatic onset of painful spasmodic contraction of muscles leading to difficulty in swallowing and ejection of fluid. Patient dies after two to three days. The paralytic form is characterised by progressive muscular paralysis starting from the site of bite, hydrophobia, excessive salivation, photophobia and finally death due to respiratory failure. Vaccinating animals is quintessential to check human rabies death. Stray animals and pets should receive initial dose of vaccine at 3 months of age followed by a booster dose after 1 month. This article provides a brief note on Rabies and its current status.

Key words: Rabies, lyssa virus, vaccination, 100% preventable, elimination

Introduction

World rabies day is celebrated across the globe each year on 28th September, to honour the death anniversary of Louis Pasteur, a French chemist and microbiologist who developed the first efficacious vaccine against rabies in 1885 (Alamdary *et al.*, 2025). It advocates measures to prevent rabies and marks the progress that the world has effectuated in controlling this horrifying fatal zoonotic malady. The theme for World Rabies Day 2026 is "Stronger together" emphasizes teamwork across human, animal and environmental sectors pertaining to the principles of 'One Health' and moving beyond the status quo.

Owing a pet provides myriads of benefits. It diminishes anxiety, stress, and depression, ease loneliness, enhances physical activity persistence, improves mental wellness etc. But are your pet vaccinated? If not then

think twice!!! The dog bite (83.5%) constitutes the major sources of rabies related fatalities.

Rabies though highly fatal, yet can be prevented by vaccination. As per a report of WHO published in September 2026, Chile became the 1st Country in South America to eliminate dog mediated rabies as a public health problem. Though many countries or states are able to control rabies due to decades of efforts but it still continues to persist worldwide. Rabies is prevalent in more than 150 countries including India. Dogs serve as the primary source of human rabies death contributing up to 99% of rabies cases transmissible to man. According to sources, every nine minutes, someone in third world countries succumb to this deadly disease. Globally, rabies causes 59,000 human deaths annually. In continents like Asia and Africa, the burden of the disease is influential resulting in thousands of fatalities each year (Alamdary *et al.*, 2025). About 40%

of the victims are children under the age group of 15 years (Hampson *et al.*, 2015). As per a report of ICAR-NIE published in 2024, annually 9.1 million animal bites occur in India with over and above three quarters of them caused by dogs. No of deaths due to Rabies in India are very high. As per the study conducted by The Directorate of Public Health and Preventive Medicine, 121 rabies associated deaths were registered between 2018 -2022. The study considered incomplete vaccination or improper vaccination as one of the prime causes of rabies associated death in human (Taylor *et al.*, 2015).

In 2021, Central government has declared Rabies as a notifiable disease thus promoting States and Union territories to mandate its reporting. Following the directives of Union Health Ministry, many states/UTs have declared Rabies as notifiable disease. With huge number of rabies cases coming up, Karnataka declared human rabies as a notifiable disease under the Karnataka Epidemic Disease Act, 2020. ARV (Anti Rabies vaccine) and Rabies immunoglobulin have been made a part of their regular indent. Since, Oct 2023, State government is providing free rabies vaccine irrespective of APL or BPL status.



Fig1: Lyssa virus (Source: CDC)

Transmission

Man acquires the infection primarily through bite or scratch of a rabid animal or when the virus laden saliva comes in contact with abraded skin or mucous membrane of eye or mouth (CDC, 2026). However, touching, feeding or licks on intact skin do not lead to the disease as the virus cannot penetrate intact skin. Aerosol infection has been reported following exposure to bat caves or on account of laboratory accidents. Saliva from the diseased

animal contains the virus and serves as the source of infection in nearly all the cases. Human to human transmission is extremely rare but can occur through organ transplantation. Case fatality in rabies is 100% after the onset of clinical symptoms.

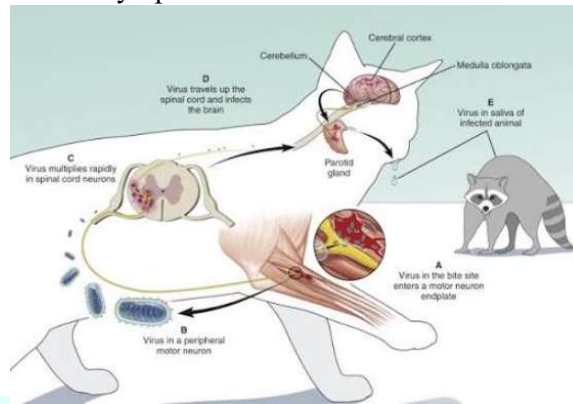


Fig 2: Pathogenesis of Rabies (Source: Science Direct)

Clinical Symptoms

The incubation period of rabies ranges from 1-3 months. In few cases, it might vary from 10 days to several years (CDC, 2026). It is usually shorter in children than in adults. The incubation period of the disease depends on proximity of the site of the bite to the CNS, viral load in the wound, degree of innervations and amount of tissue damaged. The initial signs of rabies in humans include fever, sore throat, headache, fatigue, weakness, pain or burning or tingling sensation at the site of the bite. The condition becomes more severe as the virus multiplies and spread through the CNS.

There are two classical forms of rabies based on the route the virus takes to reach the brain. The furious form of rabies is characterised by hyper excitability, increased muscular tone, excessive salivation, dilatation of the pupil, dramatic onset of painful spasmodic contraction of muscles leading to difficulty in swallowing and ejection of fluid. Patient dies after two to three days. The paralytic form runs less dramatic but has longer course than furious form and accounts for 20% of the human rabies cases. It is characterised by progressive muscular paralysis starting from the site of bite, hydrophobia, excessive salivation, photophobia and finally death due to respiratory failure (CDC, 2026).

Animals also manifest two forms of rabies. Furious form exhibits excitement, abnormal behaviour, unusual bark and excessive salivation. The dumb form presents muscular incoordination and progressive paralysis. Animal dies in 7-10 days.



Fig: Clinical symptoms (Source: CORDIS-European Union)

Prevention and Control:

We generally assume the pets to be safe but it is not so. Even if the pet is vaccinated, people should receive proper vaccination against rabies in case of bites or scratch. Rabies can be prevented following pre-exposure and post-exposure vaccination after a bite from wild/stray or pet animals. Pre-exposure rabies prophylaxis is recommended for people at highest risk of exposure to rabies virus owing to their occupation or residence. For pre-exposure prophylaxis, one dose is administered on each day of 0, 7 and 21 or 28th day. Antibody-titre should be checked periodically and booster is advisable for titre below 0.5 IU/ml. A five days regimen is recommended for post-exposure prophylaxis which is administered on days 0, 3, 7, 14, 28 (Crowcroft *et al.*, 2015). Rabies immunoglobulins should be administered in case of category III exposure as well as in immune compromised patients.

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Vaccinating animals is quintessential to check human rabies death. Stray animals and pets should receive initial dose of vaccine at 3 months of age followed by a booster dose after 1 month (Crowcroft *et al.*, 2015). But in a country like India that harbours almost 25 million stray dogs, renders this as a challenging task. Immunization against rabies in wild is practised with the help of oral vaccination. It involves employment of different kinds of baits. The baits possess suitable marker (tetracycline or dye) to scrutinize the acceptance of the bait by the animals. Oral vaccine is especially valuable for vaccinating fox, mongoose, wild racoons and other small wild animals.

Conclusion

Although many communities across the globe are successful in eliminating, there still remain many challenges such as gaps in communication, fragmented systems, lack of cold facility infrastructures etc. This year theme calls for strong partnership among all stakeholders in line to reinforce partnership and align efforts to expand life saving vaccinations, improve surveillance and reporting system, build sustainable community led solutions. Elimination of Rabies demands one coordinated system with interconnected actions. As the disease results from human-animal interface, collaborative efforts should be made by both medical and veterinary professionals in conformity with "One Health. One health is a collaborative, multisectoral approach- working at the local, regional, national and global level to attain optimal health for people, animal and environment. This concept was advocated by World health Organisation, Food and Agricultural Organisation and World organisation for Animal Health to fight infections by human-animal-environment interface. In order to achieve WHO's target "Zero human rabies death by 2030" collaborative efforts need to be made by all its global partners.

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