



# Frzequency And Outcome Of Dog Bites And Rabies Vaccination In Maharashtra

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## Abstract:

Human dog bite injuries are a neglected public health issue in developing countries and are ignored globally. Annually, rabies spread by dogs is thought to kill 59,000 people worldwide. The Maharashtra health department declared rabies as a notifiable disease. Rabies is a disease that can be prevented with a vaccine. For intramuscular (IM) and intradermal (ID) vaccination, India currently adheres to the most recent Thai Red Cross Schedule.

Keywords: Rabies, Dog Bites, Anti Rabies vaccine, India, Maharashtra

## Introduction:

Human dog bite injuries are an underreported public health issue in underdeveloped nations and are disregarded globally. Rabies can develop in people if untreated dog bites from non-vaccinated dogs. Annually, rabies spread by dogs is thought to kill 59,000 people worldwide. India is responsible for 36% of rabies-related deaths worldwide, according to the WHO. Moreover, India is responsible for 65% of the rabies-related fatalities in South East Asia. Between 2012 and 2022, 6644 clinically suspected cases and fatalities of rabies in humans were recorded by the National Rabies Control Program. The Maharashtra health department declared rabies as a notifiable disease. As per the World Health Organization (WHO), at least 200 rabies deaths occur in Maharashtra every year but only around 20 are notified to the authorities.

It can manifest In two stages: prodromal and acute neurologic. The prodromal phase is characterized by fever, headache, nausea, vomiting, paresthesia, pain or pruritus at the site of bite; it usually begins after the wound has healed. The acute neurologic period can manifest as an encephalitic or furious form, as well as a paralytic or dumb form. The furious form accounts for 70% - 80% of cases and manifests as fever, convulsions, hallucinations, confusion, agitation, combativeness, hyper salivation, goose flesh, cardiac arrhythmia, or priapism. Hydrophobia and aerophobia are caused by involuntary painful contractions of the diaphragm, accessory respiratory muscles, laryngeal and pharyngeal muscles when swallowing water and

when exposed to a draft of air. Death occurs within days. The paralytic phase is characterized by muscle paralysis that progresses from the site of exposure to quadriplegia. They live longer than encephalitic patients, but they are more likely to die from multiple organ failure.

Despite the fact that the disease can be controlled and prevented, current mortality estimates almost certainly underestimate the true incidence of human rabies deaths. Between June 1 and July 10, five people died from rabies, and 6,691 people sought treatment for dog bites at 23 state-run medical colleges and hospitals in Maharashtra, according to data from the Medical Education and Drugs Department. Human rabies is a preventable disease, so the World Health Organization (WHO), the Food and Agriculture Organization (FAO), the World Organization Animal Health (OIE), and the Global Alliance for Rabies Control (GARC) have joined forces to aim for zero human deaths from dog-mediated rabies by 2030. Proven rabies prevention and control measures will include dog vaccination and the administration of post-exposure prophylaxis (PEP) to those who have been exposed. Enhanced laboratory-based surveillance, pre-exposure vaccination of at-risk groups, and educational outreach to improve community knowledge and practices are among the others.

The current rabies crisis is uncontrollable in many countries, including India, because stray dogs and other rabid animals roam freely and attack people. Local municipalities must be resourced and funded more effectively in order to develop effective control measures. Concerns have been raised about the mismanagement of street dogs during the COVID-19 lockdown, resulting in disruptions in vaccination and birth control activities. Post-pandemic aggression among dogs has been observed in India, most likely as a result of food shortages, pet abandonment, and a decrease in human-dog interaction.

Cases of rabies infection after dog bites rose by over 100% in Maharashtra during the first year of Covid, RTI data has revealed. The state registered 2,680 cases in 2021-2022 compared to the 1,296 cases it had registered in 2021-2022, the health department said in its response to the RTI application filed by this correspondent. In fact, the increase in rabies cases occurred despite a decline in dog bites in 2022-2023. Experts believe that the delay or inadequacy of care for dog bite victims was a major contributor to the increase, as large amounts of medical resources were redirected to combat Covid-19. "Due to the panic around Covid, many with dog bites appear to have missed quick and proper care – cases of rabies were more compared to the previous year when instances of dog bites were actually higher," said Dr Amitav Banerjee, an expert in community medicine. According to state data, Nagpur district recorded 361 rabies cases in 2023, followed by Latur district (293 cases), Ahmednagar district (279 cases), Buldhana district (270 cases), and Pune district (155 cases).

During the 2020-2021 timeframe, there were no cases in Mumbai. Every year, India reports about 100 rabies cases and deaths. Because of significant underreporting, these data are highly ambiguous. According to The Times of India, rabies kills over 20,000 people in India each year, with youngsters under the age of 15 accounting for up to 60% of cases. According to WHO estimates, over 200 rabies-related deaths occur in Maharashtra alone. According to WHO, just one-tenth of these incidents are reported to health authorities.

Rabies is a disease that can be prevented with a vaccine. For intramuscular (IM) and intradermal (ID) vaccination, India currently adheres to the most recent Thai Red Cross Schedule. The current PEP regimen consists of eight ID doses (two sites per visit on days 0, 3, 7, and 28) or five IM doses on days 0, 3, 7, and 28. (0, 3, 7, 14, and 28). Improper or non-administration of RIG, as well as poor wound management, gives the virus more time to spread. Even with the proper PEP, an unfortunate outcome is possible. Following vaccination, it is a race between the body producing antibodies and the virus reaching the brain. It has been proposed that if nerves or areas close to the brain are affected, the vaccine will not have enough time to act. As a result, the vaccine alone is insufficient to prevent rabies in category III exposure, and RIG should be administered as soon as possible to provide passive immunity.

For a minimum of 15 minutes, the WHO recommends flushing and washing the wound with water, soap, detergent, povidone-iodine, or other virucidal agents. Preexposure prophylaxis (PrEP) should be recommended for high-risk populations and children who have limited access to PEP and where the incidence of dog bite exceeds 5%. Surveillance should be implemented to distinguish rabies-infected dogs from noninfected dogs, and infected dogs should be managed accordingly. To educate the public about rabies, first aid measures, and the importance of seeking timely care, effective mass media campaigns are required.

Following a rabid animal bite, the modern rabies vaccines viz. human diploid cell vaccine, purified chick embryo cell rabies vaccine, purified verocell rabies vaccine and purified duck embryo vaccine, even if given immediately after the bite, are capable of producing the seroprotective titre (0.5IU per ml) in the bitten person only by about day 14 (14 days after the first dose of vaccine), thus leaving the person vulnerable to rabies during this window period of the first fortnight. Thus, these individuals are vulnerable to rabies despite the timely and full 5-6 doses of any modern rabies vaccine and proper wound care. In these individuals only RIG are life saving, as their timely and proper administration neutralizes the virus in the wounds and aborts the risk of developing rabies.

Equine rabies immunoglobulin (ERIG) is economical as compared to human rabies immunoglobulin and hence more affordable to patients in developing countries, like India. However, ERIG has potential to cause anaphylaxis, serum sickness and other allergic reactions and thus, physicians are hesitant to use it. The current incidence of anaphylaxis to modern ERIG is about 1:35,000-40,000 cases, which can be considered rare. Till date none has died of anaphylaxis following ERIG. HRIG produced under good manufacturing practices is virtually devoid of serious adverse reactions. The dose for HRIG is 20 IU/kg body weight, and for ERIG and F(ab')<sub>2</sub> products is 40 IU/kg body weight.

Given the rise in animal bites and rabies deaths, Maharashtra should consider using PrEP as a stopgap measure until canine control is achieved. PrEP must be provided to all children in endemic areas. During the crisis period, cross-state sharing of vaccines and RIG should be implemented. To keep dogs off the streets, it is also necessary to promote street dog adoption and enforce strict pet ownership regulations. In conclusion, there is a need for integrated and comprehensive street dog and bite management.

#### Shortcomings of Animal Bite Surveillance.

Under IDSP – Only Dog bite data is collected. No data collection of Rabies deaths.

No system to capture other animal bites (e.g. Wolves) which are common in tribal belt.

Reporting from municipal areas is lacking. (Mumbai has > 80,000 dog bites/year)

No reporting from private sector.

#### State Plan of Rabies Control

Strengthening of Surveillance of human & animal rabies.

Coordination with Animal Husbandry dept to identify Rabies foci.

Immunization of pet dogs.

Reproduction control of stray dogs

increased access of safe and effective rabies vaccine (State has highest number of anti rabies vaccination last year)

Public awareness about Rabies Prevention & Control.(65% rabies victims took traditional treatment – Suraweera W, et al -2012)

#### 2. Basic signs and symptoms seen:

After a rabies exposure, the rabies virus has to travel to the brain before it can cause symptoms. This time between exposure and appearance of symptoms is the incubation period. It may last for weeks to months. The incubation period may vary based on

the location of the exposure site (how far away it is from the brain),

the type of rabies virus, and

any existing immunity.

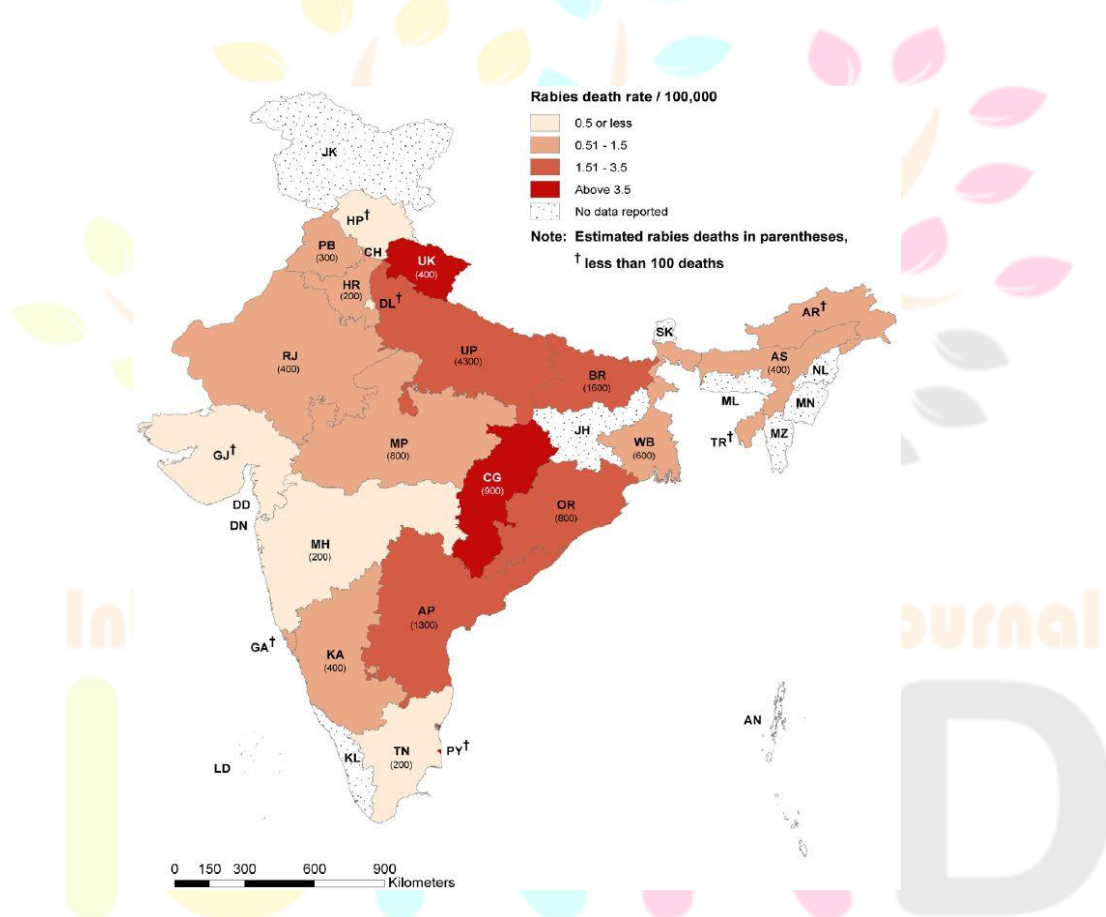
The first symptoms of rabies may be similar to the flu, including weakness or discomfort, fever, or headache. There also may be discomfort, prickling, or an itching sensation at the site of the bite. These symptoms may last for days.

Symptoms then progress to cerebral dysfunction, anxiety, confusion, and agitation. As the disease progresses, the person may experience delirium, abnormal behavior, hallucinations, hydrophobia (fear of water), and insomnia. The acute period of disease typically ends after 2 to 10 days. Once clinical signs of rabies appear, the disease is nearly always fatal, and treatment is typically supportive. Less than 20 cases of human survival from clinical rabies have been documented. Only a few survivors had no history of pre- or postexposure prophylaxis.

The signs, symptoms, and outcome of rabies in animals can vary. Symptoms in animals are often similar to those in humans. These include early nonspecific symptoms, acute neurologic symptoms, and ultimately death.

### 3. Materials and Methods:

This is a study of review and description. A study was conducted by reviewing dog bite and rabies cases from the previous four years. Information has been gathered from news articles and information on internet.



### Recommendation:

In order to achieve “Zero human deaths” from dog-mediated rabies by 2030, the “One Health” collaboration between veterinary and medical health care services must be strengthened by ensuring prompt notification of cases and immediate referral.

There is a need for increased community awareness of rabies prevention and control, with a focus on ensuring up-to-date dog vaccination, preventing dog bites, and the importance of presenting for hospital care immediately after a bite.

There is also a need to educate clinicians on current management guidelines for dog bite and rabies infection, as well as develop emergency unit care protocols.

### Declaration of Interest:



None.

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