



EMPOWERING COMMUNITIES: THE FIGHT AGAINST RABIES

Dr. Manoj Kumar Sharma* | Mrs. Bina Halder** | Mrs. Romena Begum***

*Principal, R. B. Memorial School of Nursing, Darbhanga, Bihar, India.

**Tutor/ Clinical Instructor, AIIMS Kalyani, West Bengal, India.

***Tutor/ Clinical Instructor, AIIMS Kalyani, West Bengal, India.

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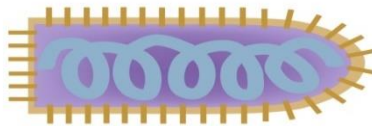
ABSTRACT

Worldwide nearly 59,000 human deaths are attributable due to rabies disease annually, out of which more than a third occur in Africa. Most of these deaths are in children. Each year, 4 million Americans are bitten by animals but very few people develop symptoms and later die from rabies because of their successful animal control and their regular vaccination programs, and a robust healthcare structure that can provide rabies vaccines to people shortly after they have contact with a possibly rabid animal. In recent years, progress has been made in both action and collaboration including implementation of surveillance and prevention measures.

Key words – Rabies, NTD, UAR, DFA, PEP, RIG, CCEEV.

INTRODUCTION

Rabies is both epizootic and enzootic disease of worldwide importance. (1) The disease is transmitted to man by coming in contact with rabid animal either through bite, scratch or lick on broken skin and mucus membrane. It is a deadly viral disease in over 150 countries, mainly in Asia and Africa. Dogs are the main source, causing tens of thousands of deaths annually. Vaccinating dogs and seeking immediate post-exposure prophylaxis (PEP) can prevent it. It costs an estimated US\$ 8.6 billion yearly. A One Health approach is crucial for awareness and mass dog vaccination campaigns. (1) The lack of awareness regarding rabies amongst community people and their malpractices as well as delay in initiation of treatment towards the management of dog-bite wounds is a major contributor to the high incidence of rabies infection and subsequent human mortality in India.



Rabies virus



Geographical Distribution:

Rabies is present on all over world except Antarctica, with over 95% of mortality reporting in Asia and Africa. (1) Rabies is one of the Neglected Tropical Diseases (NTD) that predominantly affects poor and vulnerable populations who live in remote rural locations. (1) Approximately 80% of human rabies cases occur in rural areas. Some countries, including Australia and Japan, as well as much of Western Europe, do not have rabies among dogs. Many Pacific islands do not have rabies at all. According to WHO, India accounts for 36% of the global deaths due to rabies. India also accounts for 65% of the deaths due to rabies in the South-East Asia region. The National Rabies Control Program reported 6644 clinical suspected cases and deaths of human rabies between 2012 and 2022. In India, Union territory of Lakshadweep and Andaman and Nicobar Islands are free of the disease.

WHO Response:

- Rabies in 2021–2030 Roadmap for neglected diseases.
- United Against Rabies Forum (UAR) launched.
- Focus on One Health workforce capacity.
- Priority on surveillance and data reporting.
- WHO provides guidance and supports capacity.
- Gavi includes rabies vaccines in strategy, now resuming rollout.



Causes:

Rabies virus is a bullet-shaped neurotropic RNA containing virus within the Rhabdoviridae family, specifically classified in the genus Lyssavirus, which also includes Lagos bat virus and European bat virus among others⁽²⁾ Rabies virus is present in the saliva rabid animals up to 10 days before symptoms appear. It spreads through saliva contact with wounds or mucosal surfaces.^(3,4)

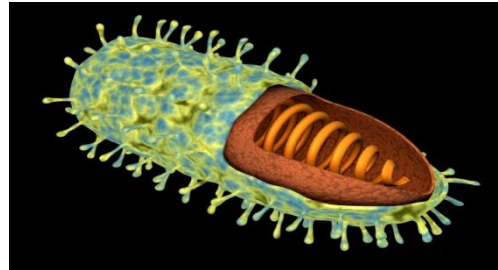
All warm-blooded animals including man are susceptible to rabies. Rabies in man is a dead-end infection and has no survival value for the virus.

Clinical Pictures of Rabies in Man:

Rabies symptoms: fever, pain, tingling. Progresses to fatal brain inflammation. Two forms: furious (hyperactivity, fear of water) and paralytic (gradual muscle paralysis, coma, death). Paralytic often misdiagnosed, leading to under-reporting.⁽¹⁾

Increased reflexes, muscle spasms along with dilatation of the pupils and increased perspiration, salivation and lachrymation may be seen on examination.⁽⁸⁾

Rabies symptoms progress from cerebral dysfunction to delirium, hallucinations, fear of death, anger, irritability, depression and hydrophobia. It's nearly always fatal once clinical signs appear, with less than 20 documented human survivors.⁽²⁾



Diagnosis:

- Rabies can be confirmed in patients early in the illness but the antigen detection using immunofluorescence of skin biopsy.⁽⁸⁾ Direct fluorescent antibody (DFA) test, which detects rabies virus antigens in brain tissue.⁽²⁾
- Rabies diagnosis relies on symptoms or contact history. Confirmation requires postmortem or specific techniques detecting viral components in tissues.⁽¹⁾

Transmission:

Rabies spreads through the bite of infected dog. Bats are the main source in the Americas. Other wild animals rarely transmit the virus. No confirmed human-to-human transmission or transmission through infected meat or milk is established.⁽¹⁾

Preventing Rabies as per WHO:

1. Vaccinate Dogs:

- Reduces transmission and need for treatment.
- Education on bite prevention is key.

2. Immunize People:

Rabies is preventable with safe and effective vaccines. WHO recommends two main strategies: post-exposure prophylaxis (PEP) and pre-exposure prophylaxis (PrEP) for prevention of human rabies.⁽⁵⁾

Post-exposure prophylaxis (PEP) as per WHO:

Local Treatment of wound

- Immediate flushing and washing with soap and water for 15 minutes after exposure.
- Irrigation of wound with virucidal agents such as alcohol (400-700 ml/litre), tincture or 0.01% aqueous solution of iodine or povidone iodine.
- Delay (at least 24 hours) suturing of wound.
- Antibiotic and anti-tetanus measure

Administration of WHO-standard rabies vaccine.



Cell-culture and embryonated egg-based vaccines (CCEEVS) are being used. Rabies vaccine can be administered intramuscularly or intradermally.

The Essen and Zagreb regimens are intramuscular dosing schedules for post-exposure rabies vaccination. The. The Zareb regimen consists of 2 doses on day 0, 1 dose on days 7 and 21 or 4 doses (2-1-1). (8) Intradermal administration for post exposure prophylaxis is 2 site regimen prescribes injections of 0.1 ml at 2 sites (deltoid or thigh) on day 0,3,7 and 28 days.

The recommendations for administration of human rabies vaccines necessarily vary from country to country. Vaccination of Animals also is of utmost importance

Exposure Risk and PEP as per WHO:

- Category I: No exposure → Wash skin, no PEP needed.
- Category II: Minor scratches or nibbling → Wash, vaccinate and RIG (Rabies Immunoglobulin)
- Category III: Transdermal bites, saliva contact, bat contact → Wash, vaccinate, administer immunoglobulin/monoclonal antibodies.

WHO recommends cost-effective intradermal vaccine administration.

PEP for previously vaccinated individuals

For rabies exposed patients who can document previous complete pre-exposure vaccination or complete PEP with CCEEV, 1 dose delivered intramuscularly or CCV delivered intradermally on days 0 and 3 is sufficient.

Five doses of CCEEV Immunization is recommended for immunocompromised individuals.

Rabies immunoglobulin (RIG) or monoclonal antibodies if indicated -

- Rabies immunoglobulin is administered for passive immunization.
- Must be administered only once, preferably as soon as possible after the exposure.
- The dose of Human RIG is 20 IU/Kg body weight for equine Immunoglobulin and F (ab')₂ products, it is 40 IU/kg body weight.
- It should be administered into or around the wound site or sites.
- Rabies immunoglobulin may be diluted to a volume sufficient for all wounds to be effectively and safely infiltrated. (8)

Guide for pre-exposure prophylaxis (PrEP):

- PrEP schedule requires intramuscular doses of 1 ml or 0.5 ml, depending on the vaccine type, or intradermal administration of 0.1 ml volume per site (one site each day) given on days 0, 7, 21 or 28.
- Booster dose needed only if rabies virus neutralizing antibody titers fall to < 0.5 IU/ml.

Nurses liabilities:

- Public health nurse has the responsibility to make community people aware about rabies especially parents.
- Nurse should demonstrate the first aid care of a wound by rabid animal.
- In hospital rabies affected patient should be isolated in quite room protected as far as possible from external stimuli such as light, noise or cold, draughts which may precipitate spasms or convulsions.
- Nurse should relieve anxiety and pain of rabies affected patient.
- Hydration must be maintained properly.
- Nursing personnel attending rabid patient should be warned against possible risk of contamination and should wear mask, gloves, goggles and aprons.
- Nurse should take PrEP of rabies
- Rabies vaccine must be stored at +2 degree C to +8-degree C.
- After reconstitution vaccine should be used immediately or within 6-8 hours if kept at correct temperature. (8)

CONCLUSION

Rabies is one of the most hazardous acute neurological illnesses. (6) The most effective way to control rabies is through PEP, involving timely vaccination with full doses. So, it is possible to implement a successful 'One Health' programme in an environment of strong political will, evidence-based policy innovations, clearly defined roles and responsibilities of agencies, co-ordination mechanisms at all levels, and a culture of open information exchange. In addition to public health surveillance, animal census and implementation of dog licensing rules,



other targeted interventions included waste management, animal birth control and anti-rabies vaccination, awareness campaigns, and widespread availability of anti-rabies vaccine at all public health facilities should be implemented.

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ABOUT AUTHORS:



Author Dr. Manoj K Sharma is Principal of R.B. Memorial School of Nursing, Darbhanga, Bihar, India. He is author of various books and material for nursing students.



Author Mrs. Bina Halder is Tutor/Clinical Instructor, College of Nursing, AIIMS Kalyani, West Bengal, India.



Author Mrs. Romena Begum is Tutor/Clinical Instructor, College of Nursing, AIIMS Kalyani, West Bengal, India.