

## EPIDEMIOLOGY, PREVENTION & CONTROL OF RABIES IN INDIA- A REVIEW STUDY.

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**ABSTRACT:** Rabies is a zoonotic disease and its magnitude of problem is underestimated due to lack of surveillance. In spite of hundred percent fatality, the optimistic view is that it is totally and absolutely preventable with the aid of effective post-exposure prophylaxis. It is prevalent mainly in the developing countries like Africa and Asia. Wild carnivorous animals act as reservoir and domestic/peridomestic warm blooded animals transmit the virus to the human population. It is popularly known as “Hydrophobia” in human and children are at particularly risk. More than 3.3 billion people live in regions where rabies is enzootic. Dog bite is the principal mode of infection in India and lower limb is the most common site of injury. Ineffective surveillance, shortage of TCV and Immunoglobulin manufacturer and its high cost, peoples ignorance of first aid measures after bite and the importance of compliance of PEP, uncontrolled street dog population etc. are the key issues which should be addressed to tackle this problem.

**KEYWORDS:** Tissue culture vaccine (TCV), Ministry of Health (MOH), Nervous tissue vaccine (NTV), Post exposure prophylaxis (PEP), Upper limb (U.limb) and Lower limb (L.limb).

**INTRODUCTION:** This is an infectious disease, also known as hydrophobia caused by Lyssa virus type I, characterized by acute and profound dysfunction of CNS, nearly always terminating in the death of the host. All warm blooded mammals are susceptible particularly carnivorous such as dogs, cats, jackals and wolves and transmitted to man by bites or licks of rabid animals<sup>1</sup>. Due to complete absence of any successful medical treatment for clinical rabies and the horrific nature of the disease, most rabies victims die at home rather than being admitted to a hospital in abysmal conditions. These circumstances add to the notorious lack of surveillance data underestimating the health implications of rabies lead many high ranking decision makers in public health and animal health to perceive rabies as a rare disease of human resulting from a bite of an uneconomically important animal (dog). Therefore, rabies usually falls between two stools and is not dealt with appropriately either by MOH or M.O. Agriculture <sup>2</sup>.

**INDIA:** It is endemic in every state of India except Andaman Nicobar Island & Lakshadweep <sup>3</sup>. Some clinico-epidemiological studies are available in India which recorded the types of animal bite, sites of injury, mode of transmission, usage of PEP etc. NTV has been banned since 2004 due to its life threatening complication and the current cell culture vaccine is quite safe and effective.

**1. MAGNITUDE OF PROBLEM, TREND AND TYPES OF ANIMALS BITE:** B.K.Kathuria <sup>4</sup> reported cases of animal rabies from different states of India during the period of 1949-67. Though the reporting was not regular and uniform, he summarized some important data. In 1967, majority cases of animal rabies were reported from West Bengal (59.89%) whereas 57% dogs, 38% cattle, followed by Punjab (14.7%) whereas 22% dogs, 55% cattle. The types of the laboratory positive cases were- dogs (59.72%), Horse & donkey (14.58%), cattle (13.19%), buffalo (8.33%), Cat (2%), camel (1.38%) and mongoose (0.69%).

The figure 1 has shown the hydrophobia cases as reported from different states from 1956 to 1969-(including nil reporting and under reporting). The peak of the curve signifies that most of the state reported during that period which indicates lack of reporting in non-peak period. Admitted cases of rabies from 41 teaching hospitals of India were 247(1965) and 252(1966) <sup>5</sup>.

Sarma S.M et.al<sup>6</sup> studied rabies in animal with laboratory diagnostic done. The endemicity of rabid dog was apparent from 78 rabid dog detected out of 83 rabid animals during the period of July 1982 to June 1983. An increase of rabies in dog was observed from October 1983 to may 1984 subsequent to detection of rabies in jackals.

Rasina S.K et.al <sup>7</sup> found that 83.7% cases were bitten by dog among which 21.8% was pet dog, followed by monkey (8.2%) and cat (8.2%).

Acc. to WHO <sup>8</sup>, India officially reported 30,000 human rabies deaths (an estimated figure which remained constant since 1990) and it accounts to 60% of global report of 50,000 deaths annually. Due to lack of any surveillance and proper reporting there is no report on current situation of rabies in India. Hence, at the behest of WHO & GOI, APCRI, a registered society was entrusted this task of doing a National Rabies survey in 2003. The burden and clinico-epidemiological profiles are clear as per findings of APCRI/WHO study on rabies in India, the incidence of animal bite is 1.7% with frequency 1 per sec and out of 17 million people only 3 million receive PEP. Incidentally, rabies positivity was reported very rarely in rats, rabbits and bandicoots, total dog population 28 million; annual man day lost for animal bite 38 million.

The biting animal mainly responsible for human rabies death was dog (96.2%) of which majority strays (75.2%) followed by pet (11.1%), wild (3.5%); cat accounted for 1.7% of deaths. The status of biting animal was unknown (46.4%) or killed (28.5%) or dead (23%) and surprisingly in 2.1% cases it was reported as alive by surviving household members. This might be that either the people were observing the wrong animal or had forgotten trivial bite by a rabid animal in the past.

Ichhpujani R.L et al<sup>9</sup> found that dog bites caused maximum morbidity (92%), followed by monkey (3.2%), cat (1.8%), fox (0.4%) etc. Most bites were unprovoked (64.3%) by stray animals (64.7%). Analysis of 192 cases of rabies, from two centres, revealed that dog bites caused maximum mortality (96.9%).

**2. AGE & SEX DISTRIBUTION:** Rao Bhanu L.N, Kalaselvan <sup>10</sup> studied that main victims were adults-83.80% and predominantly males (84.42%) affected. Rasina S.K. et.al <sup>7</sup> found that the commonest age group was 6-25 yrs(82.4%). According to WHO & GOI, APCRI survey in 2003 <sup>8</sup>, 235 Deaths Were investigated at household level by a medical team. Majority of human rabies were adults (64.7%), men (71.1%) and were from poor income levels (87.6%). Ichhpujani R.L et al <sup>9</sup> in the study, 72.4% victims were males and 47.5% were children in age group of 2-18 years. Nearly 40% were children below 15 years of age group and 78.6% were males indicating that it is an exposure related disease.

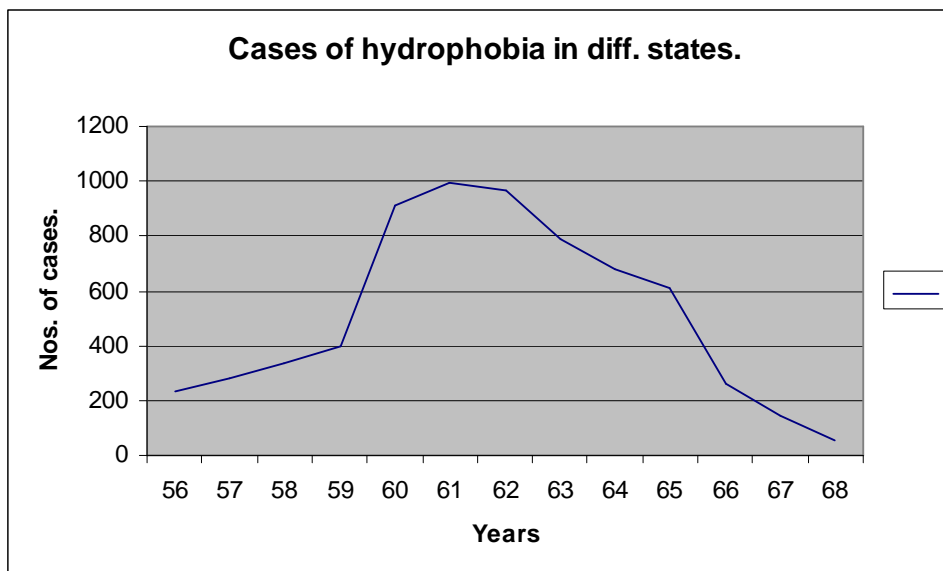
**3. TYPES OF INJURY: (Fig:2)** Rao Bhanu L.N, Kalaselvan <sup>10</sup> found type bites i.e Class III -59.81%, II-37.7%. Rasina S.K et.al <sup>7</sup> studied the common categories of bite were-class II (54.4%) followed by class I (31.3%) and class III (14.3%). The 78.9% cases completed PEP and the common sites of bite were U.limb (40.1%) followed by L.limb (36.7%). In the study of WHO & GOI, APCRI (2003)<sup>8</sup>, the commonest sites of injury were - lower limb (56.2%) followed by upper limb (20.9%), hands (17%) and then the head and face (11.5%). Ichhpujani R.L et al (2008)<sup>9</sup> found that 63% had category III exposure as per WHO classification.

**4. TREATMENT AFTER BITES:** After bite, some people have the practice of washing the wound with soap-45.6% but other harmful practices are not uncommon like application of chilly powder (29%), oil (24.5%), turmeric powder (10.9%) etc<sup>7</sup>. WHO & GOI, APCRI (2003) <sup>8</sup>, 39.5% had wound clean and 47.9% received ARV and even those who had received it mostly had incomplete/irregular/delayed treatment. The use of RIG was very low (2.1%). In 85% cases, IP < 6 months; mean IP was lowest (42days) in bites on head & face and highest (107 & 108 days) in those on upper limb (excluding hands) and lower limbs. About 45.3% of victims had resorted to indigenous treatment like-magico religious followed by herbal therapy, red chili powder. Ichhpujani R.L et al <sup>9</sup> studied that before coming to ARCs 58.5% people had washed the wound with water/soap or water alone. Some of the bite victims (10.8%) also applied chillies, salt, turmeric powder, lime, snuff powder, paste of leaves, acid, ash given by Peer Baba(magician) etc.

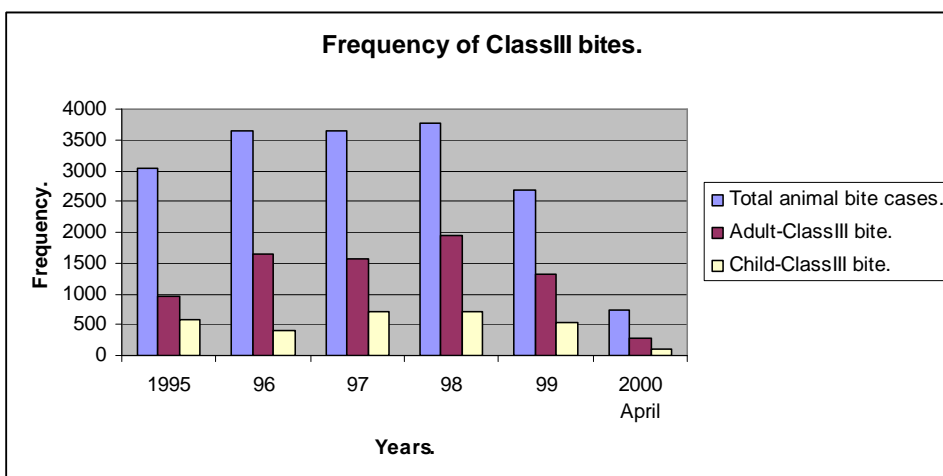
**5. RABIES CONTROL IN DOG:** A WHO expert consultation meeting on Rabies has identified mass immunization as single most effective tool for dog rabies control whereas dog culling alone is ineffective <sup>11</sup>. Studies have shown that, in general, 80-90% of the dog population is accessible for vaccination, thus confirming that the concept of controlling rabies through mass vaccination is a sound one <sup>12</sup>. It has also been recommended the use of oral vaccine as a complimentary measure in dog in addition to i.m or s.c route. In the light of this oral rabies vaccine strain, ORA-DPC would offer a major opportunity for rabies control. Better part with ORA-DPC is that the strain elicits seroconversion too unlike other attenuated rabies vaccine strains, could be a good indicator to monitor the vaccinated animal in the field as always regd. by WHO <sup>13</sup>. In the majority of industrialized countries, human rabies is under control, mainly due to oral vaccination of wild animal, mandatory parenteral vaccination of domestic animal and easy access to modern cell culture vaccine, immunoglobulin for PEP, whereas these are in short supply & their high cost often prevent their use by those most in need for those product. In India, Animal Welfare Board of India (AWBI) had successfully implemented Animal Birth Control (ABC) Programmes among stray dogs in various places including Chennai <sup>14</sup>.

**6. CONCLUSION:** Rabies is a hidden but neglected public health problem in India which affects mostly the people of lower socio-economic group. Being a zoonotic disease, it cannot be eradicated but elimination or control is possible with primary health care approach like-availability of post-exposure prophylaxis, refreshment of recent guideline of PEP, re-exposure and drop-out management to physicians & medical students; evaluation of technical feasibility at peripheral level of intradermal route before implementation. Transmission chain will be broken if herd of at least 75-80% of dog population is immunized on a sustained basis. Recently, IDSP has introduced its surveillance in the reporting format.

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**\*Fig 1. shows the cases of hydrophobia as reported from different states of India.**



**Fig-2: shows frequency of Class III bites. Source: Rao Bhanu L.N, Barman S (2000-01 & 2001-02).**

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