

# Epidemiological Study of Dog Bite Cases Reported at ARV Clinic of Rural Hospital Panvel in Raigad District of Maharashtra, INDIA

Virendra Wankhede<sup>1</sup>, Prasad Waingankar<sup>2\*</sup>, Seema Anjenaya<sup>3</sup>, B. T. Telang<sup>4</sup>

{<sup>1</sup>Senior Resident, <sup>2</sup>Associate Professor, <sup>3</sup>Professor & Head}, Department Community Medicine M. G. M. Medical College, Navi Mumbai, Maharashtra, INDIA.

<sup>4</sup>Medical Superintendent, Rural Hospital, Panvel, Navi Mumbai, Maharashtra, INDIA.

\*Corresponding Address:

[wprasad67@gmail.com](mailto:wprasad67@gmail.com)

## Research Article

**Abstract: Introduction:** Rabies is almost always fatal in animals or in humans those do not receive post-exposure prophylaxis (PEP). The dog-bites are the primary source of human infection in all rabies endemic countries and account for 96 % of rabies cases in South East Asia region. The present study has been conducted at a Rural Hospital Panvel (India) situated in rapidly urbanizing area aimed to know the epidemiology of dog bites. **Methodology:** All the patients who reported at Anti Rabies Vaccine (ARV) clinic with complaints of dog bite during the period of three months (September - November 2012) were included in this study for data collection by exit interview method. The data was analysed using Microsoft Excel, Epiinfo and SPSS. **Results and Discussion:** Total 318 dog bite cases were reported to ARV clinic during the period of 3 months. Majority were males (80.2%). More than 30% patients were in the age group of 26 to 45 years while 27.8% patients were children below 15 years. More than 70 % dog bites have taken place while victims were walking on the road. More than 97% of the bites were unprovoked and by stray dogs. Out of 318 victims, 164 (51.6 %) had knowledge about benefit of immediate cleaning of the wound. Proportion of using home remedies is negligible compared with other earlier studies. More than 88 % patients reported within 24 hours. Most of the study findings are consistent with earlier studies conducted in India with some variations. **Conclusion and Recommendations:** It is necessary to improve knowledge level in the local population further, about the immediate cleaning of the wound by using the means of behaviour change communication methods. The civic authorities need to resort to control of stray dogs. The establishment of surveillance for dog bite cases will definitely help.

**Key words:** Rabies, Dog bite, Epidemiology, India

### Introduction

Rabies is a viral disease of the central nervous system (brain and spinal cord). It is transmitted from infected animals to humans so the disease is classified as zoonotic. The disease is almost always fatal in animals or in humans those do not receive post-exposure prophylaxis (PEP). India is a major contributor to the global rabies burden, being responsible for 17,000-20000 of the 55000-70000 deaths that modeling approaches have suggested occurring globally [1] each year [2]. Countries can be categorized depending on rabies status: high, medium and low rabies endemic countries and rabies-free

countries. Bangladesh, India and Myanmar fall in high rabies endemic countries. [3] In India rabies occurs in all parts of the country with exception of Lakshadweep, Andaman and Nicobar islands. Dog bites are the primary source of human infection in all rabies endemic countries and account for 96 % of rabies cases in South East Asia region. [4] In spite of a long standing nature of the problem and the presence of effective intervention strategies [5] for rabies control, it continues to pose a major public health challenge to program planners. Prevention of rabies in humans depends on a combination of interventions. These include provision of post-exposure prophylaxis (PEP) to exposed patients, pre-exposure immunization of people at high risk exposure, control of infection in animal reservoirs and control of dog population. [6] The recent studies show that most patients were victims of rabies due to negligence, ignorance or the inadequate availability of primary health care services. [4] To formulate the Rabies control strategies, it is important to know about the epidemiology of dog bite and the post exposure practices.

### Methodology

The study was aimed to know the epidemiology of dog bites. The objectives were:

1. To study the epidemiological characteristics of dog bite.
2. To study knowledge, attitude and practices regarding Post Exposure Prophylaxis (PEP) in case of a dog bite.

The present study is carried out at Rural Hospital (RH) at Panvel. It is situated at the outskirts of Panvel City which is a Tehsil HQ with more than 1 lakh population. The Rural hospital serves both urban and rural population. The neighboring rural area is showing signs of fast urbanization due to its proximity to Mumbai at one end while the tribal villages are not far away. The Anti-Rabies Vaccine is available on all days at ARV Clinic of the RH. All those patients who reported at this clinic with complaints of dog bite

during the period of three months from 1<sup>st</sup> September to 30<sup>th</sup> November 2012 were included in this study. An exit interview in local language (Hindi/ Marathi) was conducted to collect the relevant data after the consent. A structured oral questionnaire was used to elicit required information pertaining to epidemiology of dog bite. Information about knowledge, attitude and practices about dog bite was collected. In case of children below fifteen years the information was collected from the parent/ family member accompanying. A bite was considered provoked if it resulted from patient initiating interaction with dog such as playing with dog or annoying the dog. As per WHO guidelines the dog bite wound was classified [7] as **category I** – Touching or feeding animals, Licks on intact skin; **Category II** – Nibbling of uncovered skin, Minor scratches or abrasions without bleeding; **Category III** – Single or multiple transdermal bites or scratches, Contamination of mucous membrane with saliva from licks, Licks on broken skin. The data was analysed using Microsoft Excel, Epiinfo and SPSS.

## Results and Discussion

There were 318 dog bite cases reported to ARV clinic during the period of 3 months. As the Table 1 shows majority of the cases were (80.2 %) males while 30.2 % cases were in the age group of 26 to 45 years. It also should be noted that 88 (27.8 %) patients were children below 15 years. A study conducted by Khokhar et al (2003)[8] at Alipur, Delhi has found 69.9 % of dog bite cases were Males. This study found that 53.99 % of the cases were in the age group of less than 15 years. The WHO sponsored national multi-centric rabies study (2003) [9] found 68 % of dog bite victims were male. They found annual incidence rate of animal bites comparatively higher (2.5%) among the children below 14 years of age. A study at Ahmadabad (2010) [10] by Venu Shah and others found that 25.2 % of dog bite cases were below 15 years of age. As the figure 1, show every month majority of the cases were reported from neighbouring rural area. Observed Rural to Urban proportion of cases was 2:1. However the numbers of cases being reported from urban area are also quite substantial. As seen in Figure 2, majority of the victims (190, 59.7 %) were of Category III as per WHO Classification, while 126 (39.6 %) belonged to Category II and 2 (0.7 %) patients were from Category I. In the multi-centric study conducted in India [11] Category I wounds were found 3.2% while Category II & III wounds were 33.6% and 63.2 % respectively. In majority of cases, 209 (65.7%) the site of bite was lower extremities while in 108 (33.9%) victims the bite was at upper extremities. In only 1 case bite was seen on forehead. The recent study conducted at Nagpur [12] has found that in 89.3 % cases the bite was on extremities. In the study conducted at Alipur [8] the percentage of bites on extremities was 88.17%. Out of 318 only 9 (2.8 %) bites were by Pet dog while

remaining 309 (97.2%) bites were by stray dogs. The information about the vaccination of Pet dog could not be obtained. Only 5 (1.6%) bites were provoked of these 4 were by provocation of Stray dog while 1 form Pet Dog. The study conducted at Nagpur [12] has found unprovoked bites in 80.6% of cases while percentage of bites by Pet dog was 19.2%. In study at Alipur [8] the unprovoked bites were 74.76% while bites by stray dog were 73.80%. As the Table 2 shows all strata of life are vulnerable to dog bites, but significant number of students are being affected. The 33 (31.1%) cases belonged to field job category were mainly vendors, carpenters, plumbers, electricians etc. Occupation wise susceptibility for dog bite has been not found in the literature. Majority of dog bites, 262 (82.3%) have taken place at morning time between 6 AM to 4 PM. During the evening period of 4 PM to 8 PM, 17 (5.4%) subjects suffered from Dog bite while 39 (12.3%) were bitten in the night between 8 PM to 12 mid-night. There was no case dog bite between mid-nights to 6 AM. Proportion of dog bites in night was more in Urban (14.3%) compared to Rural (11.3%). In the study at Alipur [8] it was found that 60.38% bites were in morning, 19.16% at Noon, 14.37% in the evening and 6.07% at night. As the Table 3 shows majority of unprovoked dog-bites, 225 (71.9%) out of 313, have taken place while walking on road. The 12 (3.8%) cases gave the history of applying home remedies, including ayurvedic oil, chilli powder, chuna, savlon and turmeric, before coming to ARV clinic. The proportion of home management is negligible compared with other studies. [8, 10, 11, 12] Out of 318 victims, 164 (51.6 %) had knowledge about benefit of immediate cleaning of the wound. This proportion was almost same in both Rural (50.9%) and Urban (53.0%) areas. However in 42 (25.6%) cases despite the knowledge, wound was not cleaned before coming to ARV Clinic. The proportion was higher in Urban (34.6%) compared to Rural (21.4%) area. Those who have cleaned the wound, 59 (48.4%) cleaned with water only, while 61 (50.0%) cleaned with water and soap and 2 (1.6 %) have used antiseptic while cleaning. Proportion of cleaning the wound only with water was 53.4 % in rural and 35.3 % in urban area. Out of 122 who cleaned the wound, 86 (70.5%) have cleaned it in 5 minutes, 35 (28.7%) cleaned in 10 minutes while 1 patient cleaned it after 10 minutes. In study at Nagpur [12] majority of patient have found to be applying chili paste (39.1%) while only 3.8% have cleaned the wound with water and soap. Similarly in study at Ahmadabad [10] only 24.9% had done wound cleaning while more than half cases 52.6% had applied indigenous material on the wound. In the Multi-centric study [11] the 34% washed the wound with soap and water while 24.5% washed with water only. Only around 5% of the patients have gone to Private Health Practitioner before coming to ARV clinic. As the Table 4 shows majority of cases (88.4%)

reported to ARV clinic within 24 hours of dog bite, 244 (76.7%) within 12 hours while 37 (11.7 %) between 12-24 Hrs. The other extreme is that, one case has reported almost one month after the incident. The study by Venu Shah [10] has reported that 68.5% of cases have attended ARV clinic within 24 hrs, while another 17.5% attended within 2 days. In another similar study at Beharampur, Orissa [13] 12.6 % cases reported to ARC within 24 hrs., while 61.2 % cases reported between 24-48 hrs., while 0.5 % cases reported after one month or more.

### Conclusion and Recommendations

The present study has been conducted at a Rural Hospital situated in rapidly urbanizing area and show similar findings as in previously conducted studies in India with some variations. As seen in earlier studies, majority of the dog bite victims were having wounds of Category III (59.7%), followed by Category II (39.6 %) and Category I (0.7 %). The site of the bite is mostly extremities and that too, lower one. Majority of the dog bites have taken place in the morning between 6 AM to 4 PM. More than 70 % dog bites have taken place while victims were walking on the road. More than 97% of the bites were unprovoked and by stray dogs. This indicates that, it is a public health issue of serious concern needing attention of civic health authorities. Consistent with other studies majority of victims were males. The 30.2 % cases were in the age group of 26 to 45 years but it is also noticeable that 27.8% patients were children below 15 years and mostly students. Though the knowledge about benefits of immediate cleaning the wound has improved compared to earlier studies the knowledge-application gap do exist. A good thing is noticed that, the proportion of using home remedies is negligible compared with other earlier studies. Also more than 75 % patients reported to ARV clinic within 12 hours of dog bite while more than 88 % patients reported before completing 24 hours. Based on the present study findings it is recommended to improve knowledge level in the local population further about the immediate cleaning of the wound with water and soap by using the means of behaviour change communication methods. The civic authorities need to resort to control of stray dogs and possibility of mass immunization of dogs should be weighed seriously. The establishment of surveillance by health authorities will definitely help. There is also need of participation of private sector and proactive efforts for it by the Government sector. A disease like rabies where no remedy is available for the cure, prevention is the best solution.

### Acknowledgements

Authors acknowledge Professor **Dr. Prakash Doke**, former Director of Health Services, Government of Maharashtra, for being instrumental in establishing alliance with rural hospital for research study purpose and all the Medical Officers and Staff at Rural hospital Panvel, for their contribution in research study.

### References

1. Knobel DL, Cleavland S, Coleman PG, Fevre EM, Meltzer MI, et al; Re-evaluating the burden of rabies in Africa and Asia; Bulletin of the World Health Organization; 2005, 83:360-368.
2. Hampson K, Cleavland S, Mganga S, Coudeville L; Partners for Rabies Prevention Technical Advisory Group (2011);Reassessment of the socio-economic global burden of rabies: Human and animal cost of global rabies; Global conference on Rabies Control Towards Sustainable Prevention at source: Incheou (Republic of Korea): 7-9 September 2011;Incheou Korea: OIE 26p.
3. Human Rabies in the WHO Southeast Asia Region: Forward Steps for Elimination; Review Article; Advances in Preventive Medicine, Volume 2011, Article ID 383870, 5 pages.
4. [http://www.searo.who.int/CDS\\_rabies.pdf](http://www.searo.who.int/CDS_rabies.pdf) (2011)
5. World Health Organization – WHO expert Consultation on Rabies – First Report: 2004: 1 – 123.
6. World Health Organization – “Rabies vaccines: WHO Position Paper”; Weekly Epidemiological Report; 2007: Volume 82, pp. 425-436.
7. K. Park; Park's Textbook of Preventive & Social Medicine; 22<sup>nd</sup> Edition; pp. 251 – 6.
8. Anita Khokhar, G. S. Meena, Malti Mehara; Profile of dog bite cases attending MCD (Municipal Corporation Delhi) Dispensary at Alipur, Delhi; Indian Journal of Community Medicine, Vol. XXVIII, Issue 4, Oct-Dec 2003, pp. 157-160.
9. M. K. Sudarshan, B. J. Mahindra, S. N. Madhusudana et al; An epidemiological study of animal bites in India: Results of A WHO sponsored National Multi-centric Rabies Survey (2003), Journal of Communicable Diseases, 38 (1) 2006; pp. 32-39.
10. Venu Shah, D V Bala, Jatin Thakker et al; Epidemiological determinants of animal bite cases attending the anti-rabies clinic at V.S. General Hospital Ahmedabad; Health line, Volume 3, Issue 1, Jan – June 2012, pp. 66-68.
11. Ichhpunjani RL, Chhabra Mala, Mittal Veena et al; Epidemiology of Animal Bites and Rabies cases in India: A Multi-centric Study; Journal of Communicable Diseases; Volume 40 Issue 1, 2008, pp. 27 – 36.
12. Mohd Junaid, Tabrez Ahmad, Gumastha R, Deoke A R; Epidemiological study of Dog Bite Victims In Anti Rabies Clinic of A Tertiary Care Hospital; Indian Journal of Biological and Health Science; Volume 1, Issue 1, Oct 2012, pp. 12-16.
13. T. R. Behera, D. M. Satpathy, R. M. Tripathy, A. Sahu; Profile of Animal bite cases attending the ARC Clinic at Beharampur, Orissa; <http://rabies.org.in/rabies-journal/rabies-09-2>.

**Table 1: Age & Sex distribution of dog bite cases**

Age Group (Yrs.)	Female			Male			Total	
	No.	Col. %	Row %	No.	Col. %	Row %	No.	%
0 – 5	7	11.1	29.2	17	6.7	70.8	24	7.6
6 – 15	13	20.6	20.3	51	20.0	79.7	64	20.1
16 – 25	11	17.5	14.1	67	26.3	85.9	78	24.5
26 – 45	20	31.8	20.8	76	29.8	79.2	96	30.2
46 – 60	7	11.1	16.7	35	13.7	83.3	42	13.2
> 60	5	7.9	35.7	9	3.5	64.3	14	4.4
Total	63	100	19.8	255	100	80.2	318	100

**Table 2: Dog bite victims by Occupation**

Category	Number	Percentage
Under -5	20	6.3
School Students	68	21.4
College Students	41	12.9
Office / Shop*	23	7.2
Housewife	28	8.8
Farmer	33	10.4
Field Job	99	31.1
Retired	6	1.9
Total	318	100.0

\* In 2 cases the victims were working in Mutton shop

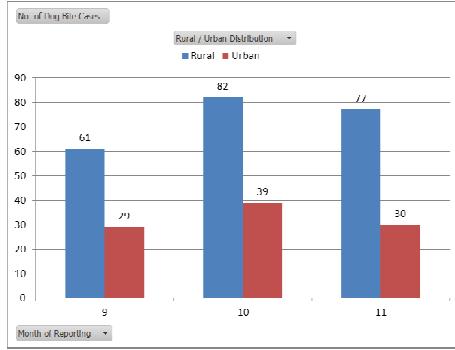
**Table 3: Place of Dog bite in Urban & Rural Area\***

Place of Dog-bite	Rural		Urban		Total	
	No.	%	No.	%	No.	%
At or Near Home	12	5.5	5	5.2	17	5.4
Near Handpump	5	2.3	2	2.1	7	2.2
Near Market Area	7	3.2	2	2.1	9	2.9
Near Playground	3	1.4	0	0.0	3	1.0
Near School Premises	30	13.8	9	9.4	39	12.5
On Road Driving Bike	9	4.2	4	4.2	13	4.1
On Road Walking	151	69.6	74	77.0	225	71.9
Total	217	100	96	100	313	100

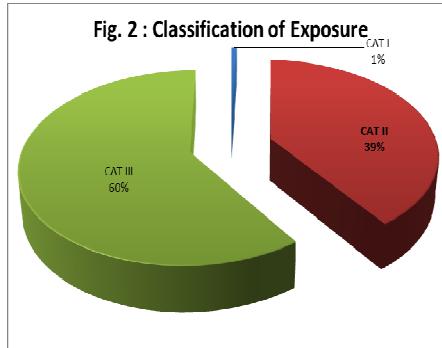
\* Excluding 5 provoked dog bites. n= 318 - 5 = 313

**Table 4: Time taken to Report for ARV**

Time Period	No.	Percent
Within 12 Hrs.	244	76.7
12 – 24 Hrs.	37	11.7
24 – 48 Hrs.	29	9.1
More than 48 Hrs.	8	2.5
Total	318	100.0



**Figure 1: Rural & Urban distribution of dog bites**



**Figure 2: Classification of Exposure**