



AN EPIDEMIOLOGICAL STUDY OF DOG BITE CASES AT TERTIARY CARE HOSPITAL, AJMER

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ABSTRACT **Background:** Rabies is a viral disease which is transmitted through the bite of a rabid animal. It is a fatal but also preventable disease. It is an endemic disease in India. Primary source of human infection is dog bite in all rabies endemic countries. It is an important public health problem. Virus which cause rabies is classified under Rhabdoviridae family. It can cause death of mammals by infecting the central nervous system. Transmission of virus occurs through saliva from animal to human or animal to other animal by biting, scratches and licks on damaged skin or mucous membrane. This study offers evaluation of the epidemiological factors of dog bite cases and pattern of disease. **Methodology:** It is a hospital based cross sectional study done in anti-rabies clinic of tertiary care hospital, Ajmer. The objective of study is to know various epidemiological factors of dog bite cases who comes in anti-rabies clinic. Study period was of 6 months from January 2022 to June 2022. **Results:** During study period 3484 dog bite cases came for treatment, out of them 71.27% cases were male and 28.73% cases were female. 0-15 years age group cases (34.82%) were more as compare to other age groups. There were only 7.46% cases of age group >60 years. Out of total cases 78.50% and 21.50% were from urban area and rural area respectively. In this study less defaulter were observed as compared to cases who took complete treatment. More cases were bitten by stray dogs as compared to pet dogs. Leg and hands were bitten more as compared to other body parts. Most of the cases took treatment within 1 hour. **Conclusion:** Identification of epidemiological factors helps us in knowing the pattern of disease

KEYWORDS : Rabies, Rhabdoviridae, Anti-rabies Clinic

INTRODUCTION

Rabies is a viral disease which is transmitted through the bite of a rabid animal. It is a fatal but also preventable disease. (1) It is an endemic disease in India. (2) Primary source of human infection is dog bite in all rabies endemic countries which is responsible for 96 % of rabies cases in South East Asia region. (3) It is an important public health problem. (4) Virus which cause rabies is classified under Rhabdoviridae family. It can cause death of mammals by infecting the central nervous system. (1) Transmission of virus occurs through saliva from animal to human or animal to other animal by biting, scratches and licks on damaged skin or mucous membrane. (3) More than 90% cases of rabies animals of united States occurs in wildlife. Raccoons, skunks, bats, and foxes are the most common wild animal which carry rabies in united states. Cats, dogs, cattle and horses can also get rabies. (1) In India global burden of rabies is 35% and 17.5 million incidence of animal bites occur per year. In India 7.4 millions dog bites were observed in year 2018 which was more as compare to 4.2 million in year 2012 as reported by Integrated Disease Surveillance Programme. Goal of zero death by dog mediated rabies has been set by WHO (World Health Organization), OIE (World Organization for Animal Health), FAO (Food and Agriculture Organization of the United Nations) and GARC (Global Alliance for Rabies Control). (2) In India cases of rabies are under reported since long time hence true burden of disease is not reflected, therefore improved reporting system is needed to know the magnitude of epidemiological burden of dog bites and rabies. (2) Animal bites exposure is categorized into 3 categories by WHO which are category I (no exposure), category II (exposure) and category III (severe exposure). Administration of post-exposure prophylaxis (PEP) in given time to the animal bite cases can prevent from the disease. It includes management of wound, anti-rabies vaccine and anti-rabies immunoglobulines administration as per schedule. Anti-rabies vaccine can be given by intramuscular (IM) or intra-dermal (ID) routes under different schedules recommended for category II and III exposures. (2) Vaccination of dogs is a cost effective way to protect human from getting rabies and also helpful in controlling and eliminating disease. (5) People who never vaccinated before exposure should receive anti-rabies immunoglobulin (HRIG/ERIG) as per schedule and anti-rabies vaccine doses on 0, 3, 7 and 28 day as per intra dermal schedule and on 0, 3, 7, 14 and 28 day as per intra-muscular schedule. People who vaccinated previously before exposure should be given only anti-rabies vaccine. Adverse reactions due to anti-rabies vaccination is not so common however mild local reaction like pain, redness and itching can occur at the site of injection. (6) People of lower socio-economic status and children (5-15 years) are mainly affected group by rabies in India, because

children in India play near stray dogs hence they get dog bites frequently. (7) Objectives of this study is to recognize the various epidemiological factors of dog bite cases who comes in anti-rabies clinic of tertiary care hospital, ajmer for treatment.

MATERIALS AND METHOD

A hospital based cross-sectional study was done, it includes all dog bite cases for a period of 6 month from January 2022 to June 2022 who comes in anti-rabies clinic of tertiary care hospital for treatment. Statistical analysis was done using frequency and percentage. Continuous data was calculated as Mean $\pm$ S.D. A pre-tested structured questionnaire was used for interviewing patients.

RESULTS AND DISCUSSION

Table:1 Distribution of Cases According to Age Group

Age-group (Years)	Male	Female	total
0-15	866 (24.86%)	347 (9.96%)	1213 (34.82%)
15-30	735 (21.10%)	283 (8.12%)	1018 (29.22%)
30-50	418 (12.00%)	157 (4.51%)	575 (16.50%)
50-60	306 (8.78%)	112 (3.21%)	418 (12.00%)
>60	158 (4.54%)	102 (2.93%)	260 (7.46%)
Total	2483 (71.27%)	1001 (28.73%)	3484 (100%)

Table 1 shows distribution of cases according to age group. In this study 34.82% of total dog bite cases of age group 0-15 years, 29.22% of total dog bite cases of age group 15-30 years, 16.50% of total dog bite cases of age group 30-50 years, 12% of total dog bite cases of age group 50-60 years and 7.46% of total dog bite cases of age group >60 years were observed. 34.82% of total cases were of age group (0-15 years) in my study. Similar finding of 34.58% of total cases with age group (0-15 years) were observed by Patel S et al (8). It was observed in my study that children were affected mainly, this may be because children are small than adults hence not able to deal with dog attack, also they used to play with dogs in streets and get frequent bites.

Table: 2 Distribution of Cases According to Gender

Months (2022)	Male	Male child	Female	Female child	Total
January	267 (7.66%)	130 (3.73%)	111 (3.19%)	56 (1.61%)	564 (16.19%)
February	256 (7.35%)	129 (3.70%)	94 (2.70%)	52 (1.49%)	531 (15.24%)
March	354 (10.16%)	172 (4.94%)	124 (3.56%)	63 (1.81%)	713 (20.46%)

April	224 (6.43%)	114 (3.27%)	95 (2.73%)	47 (1.35%)	480 (13.78%)
May	253 (7.26%)	160 (4.59%)	129 (3.70%)	72 (2.07%)	614 (17.62%)
June	263 (7.55%)	161 (4.62%)	101 (2.90%)	57 (1.64%)	582 (16.70%)
Total	2483 (71.27%)		1001 (28.73%)		3484 (100%)

Table 2 shows distribution of cases according to gender. In my study 71.27% dog bite cases in male and 28.73% dog bite cases in female were observed. It was observed dog bite cases in males were observed more than female, whereas Saleem SM et al(9) observed 81.1% dog bite cases in male and 18.9% cases in female. Dog bite cases in males were more than females in study done by Saleem SM et al(9), which is in congruence to my study. it may be possible that men are more prone to do the works related to market or outside, they have more exposure to dogs than females as females are busy in doing household activities.

Table: 3 Distribution of Cases According to Dog Bite Grade

Grade	January (2022)	February (2022)	March (2022)	April (2022)	May (2022)	June (2022)	Total
I	1 (0.029%)	10 (0.29%)	0 (0.0%)	3 (0.09 %)	0 (0.0%)	0 (0.0%)	14 (0.40 %)
II	110 (3.16%)	91 (2.61%)	115 (3.30 %)	90 (2.58 %)	134 (3.85%)	93 (2.67 %)	633 (18.17 %)
III	453 (13.00%)	439 (12.60%)	598 (17.16 %)	378 (10.85 %)	480 (13.78 %)	489 (14.04 %)	2837 (81.51 %)
Total	564 (16.19%)	540 (15.50%)	713 (20.46 %)	471 (13.52 %)	614 (17.62 %)	582 (16.70 %)	3484 (100%)

Table 3 shows distribution of cases according to dog bite grade. In my study 68.51%, 18.17% and 0.40% dog bite cases were of grade III, grade II and grade I respectively. In my study dog bite grade III were observed more than the dog bite grade II and I. whereas Gogtay NJ et al(4) observed that grade III bites, grade II bites and grade I bites were 78.3%, 21.7% and 0.0% respectively. Grade III dog bites were observed more than dog bite grade II and I in study done by Gogtay NJ et al(4) which is in congruence to my study.

Table 4: Distribution of Cases According to Residential Area

Residential area	Number
Rural	749 (21.50%)
Urban	2735(78.50%)
Total	3484 (100%)

Table 4 shows distribution of cases according to residential area. In my study 78.50% and 21.50% dog bite cases were from urban area and rural area respectively. In my study cases from urban area were observed more than the cases from rural area. whereas Patel S et al(8) observed 72.33% cases from urban area and 27.67% cases from rural area. Cases from urban area were observed more than rural area in study done by Patel S et al(8) which is in congruence to my study. It may be possible that this anti-rabies clinic of tertiary care hospital is located in main city which is easily accessible for localized and hence more cases are from urban area than rural.

Table 5: Distribution of Cases with Complete/incomplete Treatment

Treatment	Number	Percentage
Complete	2717	77.99%
Incomplete	767	22.01%
Total	3484	100%

Table 5 shows distribution of cases according to treatment status (complete/incomplete). In my study 77.99% cases were who took complete treatment which was more as compared to 22.01% dog bite cases who did not took complete treatment. Whereas Wedde SK et al(10) observed 58.19% cases who took complete treatment which was more as compared to 41.81% cases who did not took complete treatment, which is in congruence to my study.

Table 6: Distribution of Cases According to Reasons Behind Incomplete Treatment

Reason	Number	Percentage
Negligence	453	59.06%
Distance	210	27.38%

Fear of injection	104	13.56%
total	767	100%

Table 6 shows distribution of cases according to reasons behind incomplete treatment. In my study 59.06% cases were defaulter due to negligence, 27.38% cases were defaulter because of far distance and 13.56% cases were defaulter because of fear of injection. It was observed in my study that most of the cases were defaulter because of negligence behavior towards dog bite. Whereas Sangeetha S et al(11) observed 83.3%, 8.3% and 8.3% defaulter cases because of negligence, far distance and fear of injection respectively. Most of the defaulter cases were observed because of negligence behavior in study done by Sangeetha S et al(11) which is in congruence to my study.

Table 7: Distribution of Cases According to Site Of Bite

Site of bite	Number	Percentage
Leg	2089	59.96%
Hand	872	25.03%
Body	209	6.00%
trunk	175	5.02%
Face/ neck	139	3.99%

Table 7 shows distribution of cases according to site of bite. It was observed that in 59.96%, 25.03%, 6.00%, 5.02% and 3.99% cases the site of bite was leg, hand, body, trunk and face/ neck respectively. Most of the cases were bitten on leg in my study. Whereas Sangeetha S et al(11) observed that in 56.1%, 27.6%, 7.1%, and 3.1% cases the site of bite was leg, hand, trunk and body respectively. It was observed most of the cases were bitten on leg(56.1%) and hand(27.6%) in study done by Sangeetha S et al(11) which is similar to my study. It is found during study that most easily exposed part for dog bite was legs and hand in case of adults, while in case of children more bites were observed on face and trunk. This may be because children are not able to deal with dog attacks as compare to adults, they easily fell down and get bites on face.

Table 8: Distribution of Cases According to Type of Dog

Type of dog	Number	Percentage
Stray dog	2509	72.01%
Pet dog	975	27.99%
total	3484	100%

Table 8 shows distribution of cases according to type of dog who bite them. It was observed that 72.01% cases were bitten by stray dog and 27.99% cases were bitten by pet dog. Whereas Sangeetha S et al(11) observed that 75.5% cases were bitten by stray dog and 24.5% cases were bitten by pet dog which is similar to my study.

Table 9: Distribution of Cases According to Duration Before Taking Treatment

Duration before taking treatment	Number	Percentage
Within 1 hour	1115	32.00%
1-6 hour	872	25.03%
6-12 hour	1045	30.00%
>12 hour	452	12.97%
total	3484	100%

Table 9: shows distribution of cases according to duration before taking treatment. It was observed that 32.00% , 25.03%, 30% and 12.97% cases came for treatment within 1 hour, 1-6 hour, 6-12 hour and >12 hour respectively. Similar finding of 30.6% , 26.5%, 28.6% and 14.3% cases came for treatment within 1 hour, 1-6 hour, 6-12 hour and >12 hour respectively was observed by Sangeetha S et al(11).

Table 10: Number of Cases Administered Antirabies Vaccines and Antirabies Serum During Study Period

Months (2022)	Number of beneficiaries administered ARV	Number of beneficiaries administered ARS
January	564 (16.19%)	453 (13.00%)
February	540 (15.5%)	439 (12.60%)
March	713 (20.46%)	598 (17.16%)
April	471 (13.52%)	378 (10.85%)
May	614 (17.62%)	480 (13.78%)
June	582 (16.70%)	489 (14.04%)
Total	3484 (100%)	2837 (81.43%)

Table 10: shows number of cases administered anti-rabies vaccines and anti-rabies serum. It was observed 16.19%, 15.5%, 20.46%, 13.52%, 17.62% and 16.70% of total cases were administered anti-rabies vaccines in month January, February, March, April, May and

June respectively, while 13.00%, 12.60%, 17.16%, 10.85%, 13.78% and 14.04% were administered anti-rabies serum in month January, February, March, April, May and June respectively. Anti-rabies serum was given to 81.43% of total cases.

Limitation

This study includes only cases of dog bites who come to anti-rabies clinic of tertiary care hospital, ajmer.

CONCLUSION

It was observed in my study males were more prone to dog bites as compare to female because they do outdoor activities more as compare to females. Leg and hands were bitten more as compare to other body parts by dogs. Grade III dog bites were more as compare to grade II and I which shows more aggressive behavior of dogs. Mostly stray dog were responsible for dog bites, which shows more aggressive behavior of stray dog as compare to pet dogs. More aggressive behavior of stray dogs is mainly because of lack of food, shelter and vaccination. 0-15 year age group majorly involved because children are less able to deal with dog attacks. Negligence, distance and fear of injection were the main reasons for incomplete treatment. It can be suggest to cases during visit to anti-rabies clinic that they should complete their treatment for getting prevention from rabies also teach them how to do wound care, washing of wound with soap and water for 15-20 minute is important so that they can learn and teach to others also. If pets are in their home, they should vaccinate timely for making them less aggressive and safe.

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