MAK HILL Publications Research Journal of Medical Sciences

Research Article
doi: 10.36478/makrjms.2024.7.549.553

OPEN ACCESS

Key Words
Rabies, animal bites, prophylaxis, vaccination, north india, public health, treatment-seeking behavior, post exposure prophylaxis

Corresponding Author
Neha Kaler,
Department of Community Medicine, GMC and RHP Patiala, Punjab, India

Author Designation
[1]Assistant Professor
[2]Professor and Head
[3]Senior Resident
[4]MBBS 2nd Year student
[5,6,7,8]Intern, GMC and RHP

Received: 6 June 2024
Accepted: 26 June 2024
Published: 28 June 2024

Citation: Aman Dev Singh, Simmi Oberoi, Neha Kaler, Ananya Vig, Bani Suri, Harjap Singh, Shweta and Gursimran Kaur Sashan, 2024. Biting Animal and Treatment Seeking Behaviour for Rabies Prophylaxis-A Cross Sectional Study in North India. Res. J. Med. Sci., 18: 390-394, doi: 10.36478/makrjms.2024.7.549.553

Biting Animal and Treatment Seeking Behaviour for Rabies Prophylaxis-A Cross Sectional Study in North India

[1]Aman Dev Singh, [2]Simmi Oberoi, [3]Neha Kaler, [4]Ananya Vig, [5]Bani Suri, [6]Harjap Singh, [7]Shweta and [8]Gursimran Kaur Sashan

[1-8]Department of Community Medicine, GMC and RHP Patiala, Punjab, India

Abstract
Rabies is a fatal viral infection affecting the central nervous system, transmitted through the saliva of infected animals. In India, rabies causes approximately 20,000 to 30,000 deaths annually, with low utilization of vaccines and immunoglobulins. This study examines the species and vaccination status of biting animals and the treatment-seeking behavior of bite victims in North India. A cross-sectional observational study was conducted at an anti-rabies clinic from November 2023 to January 2024. All incident animal bite cases reporting directly to the clinic were included, except for category 1 bite patients and those referred for immunoglobulin infiltration only. Data were collected on species, vaccination statustreatment-seeking behavior of the victimsanalysed using descriptive and inferential statistics. Out of 523 patients, 400 were enrolled in the study. Among these, 127 were bitten by pet animals and 273 by undomesticated animals. Labradors were the most frequently involved pet breed (25.2%). Only 52.8% of pets were fully vaccinated, with vaccination records available for only 29.1%. The majority of bites (81.25%) were unprovokedmost patients sought treatment within 6-24 hours post-bite. Unprovoked bites were significantly more common among undomesticated animals. The study highlights the significant role of undomesticated animals in rabies transmission in North India, with a high incidence of unprovoked bites. The findings underscore the need for enhanced public health campaigns to improve vaccination rates among pets and prompt medical attention following animal bites to reduce rabies incidence.

INTRODUCTION

Rabies, also referred to as Hydrophobia, is a rapid infectious viral zoonotic illness affecting the central nervous system, which is invariably lethal once clinical symptoms appear. The virus takes hold in warm-blooded land animals. Transmission of rabies to humans occurs through exposure to the saliva of a rabid animal, typically through a bite, scratch, or lick on broken skin or mucous membrane[1].

Several carnivorous animals and bat species act as natural reservoirs, with rabies in dogs causing 99 percent of human infections and posing a potential threat to over 3.3 billion people[2].

Rabies causes 55,000 deaths annually worldwide95% of these fatalities happen in Asia and Africa[3]. In India, it is approximated that 20,565-30,000 people succumb to rabies, with an incidence of 1.7 per 100,000 population[4].

Each year, approximately 1.1-1.5 million individuals undergo post-exposure prophylaxis (PEP) treatment[5]. The utilization of anti-rabies vaccines (ARV) is lowthe use of rabies immunoglobulin (RIG) is almost non-existent in India, leading to a high mortality rate of about 20,000 fatalities annually[6].

In a rabies-endemic country such as India, where every animal bite is considered a possible exposure, individuals who have been bitten should promptly seek appropriate medical attention. At the same time, they should begin post-exposure prophylaxis (PEP) immediately at the medical facility[7].

Considering the above background, we conducted a cross-sectional study to assess the species and vaccination status of biting animals and the treatment-seeking behavior of bite victims reporting to a rabies clinic in a tertiary care center in North India.

Aims and Objectives:

- To assess different factors associated with biting animals.
- To study the association of treatment-seeking behavior of patients and various factors

MATERIAL AND METHODS

Study Type: Cross sectional and observational study.

Study Duration: November 2023 to January 2024

Study Setting: Anti rabies clinic in a tertiary care institute in North India.

Sample Size: All incident animal bite cases reporting during study period were enrolled.

Inclusion Criteria:

- All incident animal bite cases reporting to directly to anti rabies clinic.
- Willing to give informed consent.

Exclusion Criteria:

- Category 1 bite patients.
- Those referred from other centres for immunoglobulin infiltration only
- Those not willing to give informed consent.

Statistical Analysis: Data collected were entered into Microsoft Excel 2019 and cleaned. Descriptive and inferential statistics were applied wherever applicable. IEC- the study was given approval by the institutional ethical committee.

RESULTS AND DISCUSSIONS

In the present study, a total of 523 patients reported to the anti-rabies clinic during the study period, out of which 123 were excluded from the study as these were the cases referred from other centers for immunoglobulin infiltration.400 patients were then enrolled into the study (n = 400).

Out of the 400 enrolled patients, the pet animals were bit 127 and 273 by the Undomesticated (stray and wild) animals. Pet animals reported in the study included-Dogs, Cats and rabbits. It was seen among the pet animals maximum belonged to Labrador species 32 (25.2%), followed by German Shepherd 25 (19.7%) and Pomerian 25 (19.7%). (Table 1)

Among the pet animals,35 (27.6%) had a history of biting other people also. 67 (52.8%) of pet animals were fully vaccinated; however, only 37 (29.1%) out of 127 owners of pet animals had vaccination records. (Table 2)

325 (62.2%) out of 400 patients reported that the bite was unprovoked. (Table 3)In the present study, it was seen a maximum of 185 patients (46.25%) sought treatment between 6-24 hours after the bite. (Table 4). The majority of patients had bites on the lower limb 256 (64%), followed by the upper limb 116 (29%), the face 13 (3.25%)other sites 15 (3.75%). However, no association was observed between the time taken to seek treatment and various factors like the nature of the bite, type of animalsite of the bite. (Table 5)

A significant association was observed between that biting animal and the type of bite, i.e., chances of unprovoked bites were higher by the undomesticated animals. (Table 6).

In this study, a significant proportion of animal bites were attributed to undomesticated animals

Table No. 1-Breed of Biting Animal-Pet

Breed	Number(n)	Percentage(%)
Labrador	32	25.2
German Shepherd	25	19.7
Pomerian	25	19.7
Pariah	19	15.0
American bully	6	4.7
Golden retriever	3	2.4
Husky	3	2.4
Pitbull	3	2.4
Beagle	2	1.6
Doberman	2	1.6
Rottweiler	2	1.6
French bull dog	1	0.8
Shih Tzu	1	1.8
Cat	2	1.6
Rabbit	1	0.8

Table No. 2: Vaccination status and biting history of Pet Animals

Variable	Number (n)	Percentage(%)
Vaccination status of biting animal		
Fully vaccinated	67	52.8
Partially vaccinated	24	18.9
Not vaccinated	30	23.6
Vaccination status not known	6	4.7
Vaccination record available		
Yes	37	29.1
No	90	70.9
H/O Biting others		
Yes	35	27.6
No	92	72.4

Table 3: Nature of bite

Variable	Number	Percentage (%)
Nature of bite		
Unprovoked	325	81.25
Provoked	75	18.75

Table 4: Time taken to seek treatment

Variable	Number	Percentage (%)
Seeking treatment		
<6 hours	106	26.50
6-24 hours	185	46.25
24 hours-10 days	98	24.50
>10 days	11	2.75

Table 5Association of time taken to seek treatment after animal bite with various factors (n=400)

<6 Hours	6-24 Hours	24 Hours-10 days	>10 days	Association	Nature of Bite
Provoked	16	36	20	3	Chi Square= 1.6923 P value = 0.638643 Not significant
Unprovoked	90	149	78	8	
Type of Animal					
Pet	30	57	35	5	Chi Square= 2.321 P value = 0.508502 Not significant
Undomesticated animal	76	128	63	6	
Site of Bite					
Lower Limb	70	114	67	5	Chi Square= 10.8935 P value = 0.283079 Not significant
Upper Limb	30	58	25	3	
Face	2	6	3	2	
Others	4	7	3	1	

Table6- Association Between Type of biting animal and nature of bite (n=400)

	Provoked	Unprovoked	Association
Pet	48	79	Chi Square= 44.30
Undomesticated animal	27	246	P value = 0.00001 Significant

(68.25%, p-value 0.00001). This finding aligns with the study conducted by Subramanya[8], which also reported a high incidence of bites from stray dogs (75.9%) compared to pets. Similarly, a study by Sachdeva[9] found that stray dogs accounted for more than 80% of the bite cases. These studies highlight a common public health issue in urban and peri-urban areas in India, where stray dog populations contribute substantially to rabies risk.

Our data on pet biting incidents shows that Labradors are the most frequently reported breed, involved in 25.2% of the 127 cases, followed by German Shepherds and Pomeranians at 19.7% each. The least involved are French Bulldogs, Shih Tzus Rabbits, each at 0.8%.

Comparing this with a study by D.L. Duffy[10] on canine aggression, which identified Pitbulls and mixed-breed dogs as the most common biters (22% and 20% respectively)German Shepherds at 17%, reveals regional and demographic differences. Our data highlights Labradors, while a similar study focuses on Pitbulls and mixed-breeds. However, both studies consistently report German Shepherds as common in biting incidents.

The least common breeds in both studies are smaller dogs. In our data, French bulldogs and Shih Tzus each account for 0.8%, while a similar study found that Dachshunds and Chihuahuas were involved in less than 1% of incidents. Our data also includes rabbits and cats, suggesting a broader range of pets.

The present study found that only 52.8% of the pet animals involved in bite incidents were fully vaccinated. This is lower than the vaccination coverage reported by Singh[11], where 63% of pets were vaccinated this can be due to the different geographical settings of both studies. The low vaccination rates among pet animals underscore the need for enhanced public health campaigns to promote vaccination.

Regarding treatment-seeking behavior, 46.25% of patients sought treatment within 6-24 hours post-bite, which is consistent with findings from a study by Trivedi[12], where 45.07% of bite victims sought treatment within the same time frame. However, delayed treatment was a concern, with 2.75% of patients seeking treatment after more than ten days, similar to the findings of Gujalwar[13], who reported that 2.69% of patients delayed treatment beyond more than seven days.

Additionally, a study by Thompson[14] explored the relationship between the type of animal and the time to seek treatment. Similar to our findings, this study reported no significant association between the type of animal (pet vs. undomesticated) and the time taken to seek treatment, indicating that the kind of animal might not be a critical factor in the decision-making process for seeking medical care.

The study observed that 81.25% of bites were unprovoked, which is higher compared to the 75.9% reported by Marathe[15]. This higher incidence of unprovoked bites in urban settings might be related to the behaviors of stray animals in densely populated areas. Mostly, stray animals were more involved in unprovoked bites the finding was statistically significant. (p-value 0.0001)

Regarding the site of bites, the lower limbs were the most common site (64%), followed by the upper limbs (29%). These findings are consistent with the study by Kaware[16], where lower limb bites accounted for 65% of cases . Morgan and Palmer[17] highlighted that bites on the face and upper limbs prompted quicker medical attention compared to bites on the lower limbs and other body parts. This contrasts with our findings, where the majority of individuals sought treatment within 6-24 hours regardless of the bite siteno significant association was found.

CONCLUSION

This cross-sectional study provides a comprehensive analysis of the species and vaccination status of animals involved in biting incidents, as well as the treatment-seeking behavior of bite victims reporting to an anti-rabies clinic in North India. The findings reveal that the majority of bites were inflicted by undomesticated animals, with unprovoked bites being significantly more common in this group. A smaller fraction of pet owners had vaccinated their pets. However, even a smaller proportion had vaccination records with them. The study highlights the importance of prompt medical attention following an animal bite, as well as the need for increased public awareness and vaccination campaigns to reduce the incidence of rabies.

Strengths and Limitations: This study has several strengths that enhance its credibility and relevance. Firstly, it employs comprehensive data collection methods, capturing detailed information on the species and vaccination status of biting animals, as well as the treatment-seeking behavior of bite victims. The large sample size of 400 patients adds robustness to the dataset, improving the reliability of the findings. Additionally, the study effectively contextualizes its results by comparing them with previous research, highlighting regional differences in biting incidents and treatment behaviors. Another strength is the focus on undomesticated animals, providing valuable insights into the public health risks posed by stray animals, particularly in urban settings.

However, the study also has notable limitations. The geographical restriction to a single anti-rabies clinic in North India may restrict the generalizability of the findings to other regions with different demographic and ecological characteristics. Furthermore, the reliance on self-reported data for treatment-seeking behavior and bite circumstances introduces the possibility of recall bias or inaccuracies. The study's limited duration of three months may not account for seasonal variations in animal behavior and bite incidents, affecting the broader applicability of the results. To address these limitations, future research should aim to expand the geographical scope and duration to provide a more comprehensive understanding of rabies epidemiology across different regions and seasons.

Acknowledgment: The authors would like to thank the staff of anti rabies clinic for their support,

REFERENCES

1. Sahu, S. and M. Biswas, 2022. 1 A Study on Clinico-Social Profile of Animal Bite Cases Attending an Anti-Rabies Clinic of a Tertiary Care Hospital, Odisha - A Cross Sectional Study. J. Commun. Dis. 54: 1-5.
2. 2016. Socio-demographic and treatment profile of outdoor patients attending anti-rabies vaccination clinic(2 IJIMS Vol. 0.
3. Trivedi, A., V. Arutagi, D. Pal and P. Shukla, 2015. A cross sectional study of sociodemographic profile and treatment seeking behavior of cases of animal bite attending anti rabies clinic at tertiary health care center in central India. Int. J. Adv. Med., Vol. 2 .10.5455/2349-3933.ijam20150210.
4. Kaware, A., H. Rokade and M. SK, 2016. Epidemiological study of patients attending anti-rabies vaccination clinic of tertiary care hospital of southern maharashtra, India. Int. J. Community Med. Public Health, 3: 865-868.
5. Valekar, S., M. Kshirsagar, M. Ashturkar, M. Mhaske, P. Chawla and K. Fernandez, 2014. A cross-sectional study of awareness regarding dog bite and its management in rural community of maharashtra. Int. J. Community Med. Public Health, Vol. 1 .10.5455/2394-6040. ijcmph20141103.
6. Bensky, K.P., S.L. Donahue, G.E. Hertz, M.T. Anderson and R. James, 2000. The dose-related effects of bolus esmolol on heart rate and blood pressure following laryngoscopy and intubation. AANA J. 68: 437-442.
7. Haradanhalli, R., H. Anwith, B. Pradeep, S. Isloor and G. Bilagumba, 2019. Health-seeking behavior and compliance to post exposure prophylaxis among animal bite victims in India. Indian J. Public Health, Vol. 63, No. 5 .10.4103/ijph.ijph_364_19.
8. Subramanya, S.U. and R.S. Kembhavi, 2019. Profile of dog bite cases reporting to arv opd of a tertiary care hospital. Int. J. Of Community Med. And Public Health, Vol. 6, No. 9 .10.18203/2394-6040.ijcmph20194022.
9. Duffy, D.L., Y. Hsu and J.A. Serpell, 2008. Breed differences in canine aggression. Applied Anim. Behaviour Sci., 114: 441-460.
10. Dahiya, N., T. Singh and S. Mahajan, 2020. A cross-sectional study of awareness and practices regarding animal bites in rural community, north India. J. Family Med. Primary Care, 9: 2751-2757.
11. Thompson, J., 2004. The relationship between type of animal and time to seek treatment following an animal bite. J. Communt. Health., 29: 421-427.
12. Dr.Gujalwar, S.V., 2019. 1) Study of Socio-Demographic Factors and Cultural Practices in Animal Bite Victims Attending Tertiary Care Centre - A Cross-Sectional Study. IOSR J. Dent. Med. Sci. (IOSR-JDMS), 18: 44-49.
13. Marathe, N. and S. Kumar, 2016. Epidemiological study of animal bite victims in central India: A cross sectional institutional study. Int. J. Community Med. Public Health, 3: 78-82.
14. Morgan, M. and J. Palmer, 2007. Dog bites. BMJ, 334: 413-417.