

A Study of Clinico-social Profile of Animal Bite Patients Attending the Antirabies Clinic of Baba Raghav Das Medical College, Gorakhpur

Parul Singh, Harish Chandra Tiwari*, Kavita Baranwal, Dharendra Kumar Srivastava

Department of Preventive and Social Medicine, Baba Raghav Das Medical College, Gorakhpur, Uttar Pradesh, India

Abstract

Background: Rabies is one of zoonotic viral disease, estimated to cause 59000 human deaths annually in over 150 countries, of which 20,000 are from India alone; about 40% of which are in children under the age of 15. Rabies though 100% fatal is preventable with post-exposure prophylaxis which includes wound washing, anti-rabies vaccination and rabies immunoglobulin.

Objective: To describe the clinico-social profile of animal bite patients attending the anti-rabies clinic of BRD Medical College, Gorakhpur.

Methodology: A cross-sectional study was conducted in the anti-rabies clinic of Nehru hospital, BRD Medical College, Gorakhpur from January 2022 to May 2022. Study participants were interviewed by using a pre-phrased, pre-designed and pre-tested questionnaire. Data regarding socio-demographic and clinical profile of the study participants following animal bite exposure was collected.

Results: The total number of animal bite victims were 250, in which majority of them were males (76.77%) and highest percentage was of adult population (20–59 years). Maximum number of victims were from rural area (78.70%). 19.35% were working and 39.35% were students. 77.43% were category III bites and in 50.96% cases lower limb was the site of bite and dogs were responsible for 89.67% of the bites. 60.64% victims did not wash the wound properly before reaching the anti-rabies clinic.

Conclusion: This study concludes that as majority of the animal bite victims were students and majority of victims were unaware about the importance of wound care, therefore a step can be taken to create awareness in various schools.

Keywords: Humans, Adult, Child, Male, Dogs, Animals, Young Adult, Middle Aged, Female, Cross-Sectional Studies, Bites and Stings, Rabies, Universities, Surveys and Questionnaires, Vaccination, Students, Immunoglobulins, Lower Extremity, Demography.

INTRODUCTION

Rabies is a zoonotic viral disease caused by Lyssavirus type 1 (other serotypes like type 2, 3 and 4 are rabies-related but antigenically distinct viruses); classified as a neglected tropical disease. Rabies is estimated to cause 59000 human deaths annually in over 150 countries, of which 20,000 are from India alone; about 40% of which are in children under the age of 15.^[1] More than 95% of human deaths due to rabies occur in Africa and Asia. An estimated 20 million human rabies post-exposure prophylaxis is given every year.^[2]

In India, 97% of human rabies follow dog bites, 2% due to cats and 1% to other wild animals. Haphazard urban planning and human overpopulation have led to a correspondingly huge street-dog population in most Indian cities.^[3]

The consequence of exposure to rabies virus depends on several factors like severity of the wound, location of the bite on

the body, quantity and variant (genotype) of virus inoculated into the wound(s), delay in post-exposure prophylaxis (PEP), timeliness of post-exposure prophylaxis (PEP). A “suspected” clinical case of rabies in humans is defined as an acute neurological syndrome dominated by forms of hyperactivity or paralytic syndromes progressing towards coma and death, usually by cardiac or respiratory failure, typically within 7–10 days of the first signs if no intensive care is instituted. The incubation period is usually between 3 weeks to 3 months,

Address for correspondence: Harish C. Tiwari,

Department of Preventive and Social Medicine, Baba Raghav Das Medical College,
Gorakhpur, Uttar Pradesh, India

E-mail: dr.harishchandratiwari@gmail.com

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rarely 4 days to 2 years or could be even longer. The median incubation period is usually known to vary according to site and severity of bite, proximity to brain viz. head and face (22 days), trunks only (45 days), upper limbs only (60 days), hands only (60 days), lower limbs only (75 days) and multiple bites (43 days).^[3]

The main three pillars for the prevention of rabies are awareness of rabies disease (and what to do in case of a bite), access to timely and affordable post-exposure prophylaxis (PEP) for people, mass dog vaccination to prevent disease at its source.^[1] Rabies though 100% fatal is preventable with post-exposure prophylaxis, which includes immediate wound management, administration of rabies immunoglobulins in severe exposures, and a full course of antirabies vaccination. Rabies is almost invariably fatal once clinical signs appear due to acute progressive encephalitis. Rabies occurs mainly in underserved populations, because of lack of awareness of preventive measures, which translates into insufficient dog vaccination, an uncontrolled canine population, poor knowledge of proper post-exposure prophylaxis and an irregular supply of antirabies vaccine and immunoglobulin. This study aims to study the clinico-social profile of animal bite cases belonging to the Purvanchal region, as our BRD medical college caters to patients from this region and then to suggest recommendations based on study findings. Although there are several epidemiological studies to determine the epidemiological pattern of animal bite patients in India, but limited data regarding the clinico-social profile of animal bite of the Purvanchal region is available.

OBJECTIVE

To describe the clinico-social profile and to know practices after animal bite in patients attending the antirabies clinic at BRD Medical College, Gorakhpur.

METHODOLOGY

Study Setting

The study was conducted in the anti rabies clinic of Nehru hospital, run by the department of Community Medicine of BRD Medical College, Gorakhpur, Uttar Pradesh.

Study Design

Complete enumeration method.

Study Period

The study was carried out for a period of 5 months, from January 2022 to May 2022.

Study Population

The study subjects were the victims of animal bite attending the antirabies clinic of Nehru Hospital, BRD Medical College.

Sampling Technique

Purposive sampling.

Sample Size

Total 250 cases, attending the anti rabies clinic during the period of 5 months.

Study Tool

Pre-phrased pre-tested questionnaire, which contains

- Socio demographic details
- Characteristics of wound
- Nature of animal bite
- Post exposure prophylactic measures (by the patient)

Inclusion Criteria

Only dog bite cases coming for vaccination were taken for study.

Exclusion Criteria

Victims who were unwilling to participate were excluded.

Statistical Analysis

Information was obtained using a pretested semi-structured questionnaire. After taking informed written consent, the personnel interview of the patient and clinical examination was done for each case. In the case of children, (< 15 years), information was obtained from their attendants. A bite was considered provoked due to patient initiating interactions such as annoying the animal or playing with it. The animal bite wound was classified as per WHO guidelines (Table 1). Data was summarized by calculating percentages using Microsoft excel. The results obtained were expressed in terms of percentages and proportions. Results are depicted as tables and graphs. Approval from BRD Medical College Gorakhpur's institutional ethical committee was taken before the study started. Ref No- IHEC/2022/08 dated- 10-08-2023

RESULTS

A total of 250 animal bite victims were recorded in the 5 month period. Semi-structured interview of 250 victims was conducted. The sociodemographic profile of the study participants has been shown in Table 2.

Sociodemographic characteristics of the study population were compared to find which of the characteristics ranked the highest in association with animal bite. The percentage of male victims (76.77%) were higher compared to the female victims (23.23%). Most of the victims belonged to the age

Table 1: Classification of animal bite wounds*

Category of wound	Type of contact/exposure
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.

*as per WHO guidelines.

Table 2: Sociodemographic characteristics of study population (n=250)

Sociodemographic profile		Frequency (%)
Sex	Male	191 (76.77)
	Female	59 (23.23)
Age (years)	0-19	108 (43.22)
	20-59	112 (45.16)
	≥60	30 (11.62)
Residence	Rural	196 (78.70)
	Urban	54 (21.30)
Education	Illiterate	45 (18.06)
	Primary school	67 (27.09)
	Middle school	37 (14.83)
	High school	27 (10.96)
	Intermediate	30 (12.25)
	Graduate and above	44 (16.81)

Table 3: Characteristic of wound (n=250)

Characteristic of wound		Frequency (%)
Category of wound	Category I	13 (5.16)
	Category II	43 (17.41)
	Category III	194 (77.43)
Type of wound	Abrasion	85 (34.19)
	Laceration	165 (65.81)
Number of wounds	Single	109 (43.87)
	Multiple	141 (56.13)

Table 4: Nature of animal bite (n=250)

Nature of animal bite		Frequency (%)
Category of biting animal	Stray animals	204 (81.93)
	Pet dogs	27 (10.96)
	Wild	19 (7.11)
Provocation	Provoked	59 (23.87)
	Unprovoked	191 (76.13)

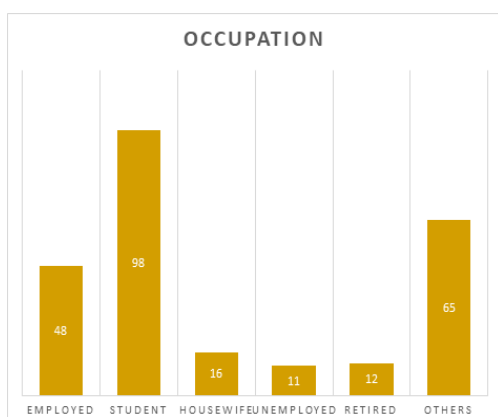


Figure 1: Dog bites in students ranked the highest (39.35%); then in employed (19.35%), housewife (6.45%), retired (5.16%), unemployed (4.51%); and others (25.18%).

group 20–59 years (45.16%), followed by age group 0–19 (43.22%) and ≥60 years (11.62%). Maximum number of victims were from rural area (78.70%). About 18.06% of the victims were illiterate, most of them were in primary school (27.09%); then graduate and above (16.81%), middle school (14.83%), intermediate (12.25%), high school (10.96%).

Majority of the victims belonged to upper class (57.41%), followed by upper middle class (34.83%) as per the modified BG Prasad socio-economic classification, update 2021. Middle and lower middle class victims recorded comparatively lower percentages of dog bites (4.516 and 3.244%, respectively). Figure 1 shows that, dog bites in students ranked the highest (39.35%); then in employed (19.35%), housewife (6.45%), retired (5.16%), unemployed (4.51%); and others (25.18%).

Table 3 shows that, 77.43% of the victims had category III bite, 17.41% of the bites were category II and 5.16% of the bites were category I as per the classification of animal bite wounds for post-exposure prophylaxis based on WHO recommendations. The majority (56.13%) of the

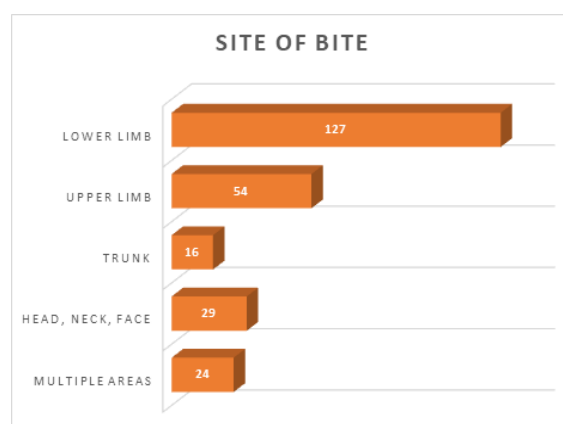


Figure 2: The most common bite site was lower limb, upper limb, trunk, head, neck & face.

Table 5: Post-exposure prophylactic measures (by the patient)

Post exposure prophylactic measures (by the patient)		Frequency (%)
Practices after bite	Washed with water only	88 (35.48)
	Washed with soap and water for < 15 minutes	98 (39.35)
	Washed with soap and water for ≥ 15 minutes	0 (0)
	Applied antiseptics	6 (2.58)
	Applied mirchi	24 (9.67)
	Applied chuna	5 (1.96)
	Consulted faith healer	10 (3.22)
	Did nothing	19 (7.74)
Initiation of treatment	Within 1 day	75 (30.32)
	2–3 days	132 (52.90)
	4–10 days	32 (12.90)
	>10 days	11 (3.88)

Table 6: Association between education and practices after bite in study population (n=250)

Practices after bite	Illiterate (%)	Primary, middle & high school (%)	Intermediate, Graduate & above (%)	Total	Test of significance (χ^2)	p-value
Washed with soap & water for <15/≥15 minutes	15 (14.75)	33 (34.42)	50 (50.83)	98		
Washed with water only/Applied antiseptic	20 (22.03)	60 (64.40)	14 (13.57)	94	24.5212	.000419
Applied mirchi or chuna/Consulted faith healer	7 (17.39)	27 (69.56)	5 (13.05)	39		
Did nothing	3 (16.66)	11 (58.33)	5 (25.01)	19		
Total	45	131	74	250		

study participants had multiple wounds with 65.81% of the participants had laceration wounds.

Table 4 shows that, 81.93% of the bites were by stray animals. A wild animal bite was 7.11% while pet dog bite was 10.96%. The bite percentage was more by stray animals. 76.13% of the bites were unprovoked while 23.87% had history of provocation.

In 89.67% of the cases dog was the biting animal followed by 5.8% monkey bites, 3.22% cat bites and 1.31% jackal bites.

Figure 2 shows that the most common bite site was lower limb (50.96%), followed by upper limb (21.93%), bites in the head, neck & face was 11.61%. Bites on multiple areas and trunk were less common (9.05 and 6.45%, respectively).

Table 5 shows that, 39.35% of the victims had washed the wound with soap and water for a short duration of time. 35.48% had washed the wound with water only and nobody had washed the wound thoroughly with soap and water for at least 15 minutes as recommended. 2.58% had applied antiseptics directly to the wound without first washing it. Wrong practices like applying mirchi and chuna was also practiced by some victims (9.67 and 1.96%, respectively) and about 3.22% of victims had consulted a faith healer. Maximum no. of patients (52.90%) initiated their treatment on 2nd or 3rd day.

The association between education and practices after bite was found to be highly significant ($p < 0.001$), as shown in Table 6.

DISCUSSION

An epidemiological study of animal bites among patients attending the antirabies clinic of BRD medical college Gorakhpur showed that males had higher incidence of bite than females, which might be due to increased outdoor activity, mobility and hence have increased risk of exposure to bite. Other studies in India have also come up with similar results with men being more commonly involved.^[4]

Among the 250 cases, 45.16% of cases belonged to the 20–59 year age group and 43.22% were in the 0–19 year age group. The finding coincide with the findings of Jain M *et al.*^[5] & Sangeetha S *et al.*,^[6] and denies the reports of study

done by Rupali R Rajput *et al.*^[7] where age group above 60 year was most commonly affected.

The maximum number of cases were from rural areas in contrast to the study done by Syed Najmul Ain *et al.*^[4] in which most of the cases were from urban areas.

Our study found that 27.09% of dog bite victims were in primary school and 18.06% were illiterates; this is quite similar to the study done by Sangeetha S *et al.*^[6] in which most dog bite victims were illiterate and victims who had finished their primary education were the second highest.

In this study majority of the victims belonged to upper class (57.41%) followed by upper middle class (34.83%) in contrast to the study done by Syed Najmul Ain *et al.* where more than half of the victims were from lower socio-economic class.

Our study shows that percentage of dog bites in students were 39.35% which is the highest. Bite percentage was second highest among the employed and others which was 19.35% and 25.18%, respectively. Similar findings were reported by Jain M *et al.*^[5] where 44.1% victims were students.

In the present study, most participants (77.43%) had category-III wounds whereas only 17.41% had category II wounds. Our results are in concordance with a previous study conducted in Rajasthan^[5] where 71.9% of the animal bite patients had category-III bites, while in contrast to the finding of study conducted by Pradeep Umrigar *et al.*^[8] in which they reported only 44% cases in class III category.

Majority (56.13%) of the study participants had multiple wound with 65.81% of the participants had laceration wounds. This finding was similar to that reported by Manasi Panda *et al.*^[9] in which 60.3% of the animal bite patients had single wound. However, this finding differed from the study by Jain *et al.*, who reported most of the study participants having single wounds and only 1% cases having multiple site bites.^[5]

In the present study, out of the 250 cases of animal bites, almost 4/5th (81.93%) of the study participants were bitten by stray animals whereas (10.96%) were bitten by pet dogs. Similar findings were reported from the study by Jain M *et al.*^[5] and Ganasva *et al.*^[10] in which majority of the study

participants 88.9 and 95.8% were bitten by street dogs, respectively. These findings suggest that the huge stray dog population is largely responsible for most cases of animal bite.

In our study, most of the bites (76.13%) were unprovoked, similar to that of the study conducted by Jain M *et al.*^[5] while Behera *et al.*^[11] reported that only 54.7% bites were unprovoked in their study.

Since dog population is increasing, dogs are mostly responsible for the bites being about 89.67% in our study followed by monkey bites (5.8%). Studies by Dhaduk *et al.*^[12] and Panda M *et al.*,^[9] also reported dog to be the main biting animal in their studies i.e. 98.8 and 88.1%, respectively.

A larger proportion (50.96%) of the study participants reported to have been bitten in their lower limb in the present study. Same finding is seen in study done by Rupali R Rajput *et al.*^[7] i.e. 66%.

In this study, 39.35% had washed the wound with soap and water for a short duration of time. 35.48% had washed the wound with water only and nobody had washed the wound thoroughly with soap and water for at least 15 minutes as recommended. This is similar to finding of study by Pradeep Umrigar *et al.*^[8] in which they found 75% cases had cleaned the wounds with water only or with water & soap; while in contrast to that of study conducted by Jain M *et al.*^[5] in which only 18.7% cases washed the wounds with running water or water with soap before attending the ARV clinic.

In our study 11.63% cases applied indigenous substances like lime, chili powder over wounds which is also an issue of serious concern. This matched the study by Sangeetha S. *et al.*^[6] in which 18.3% cases applied indigenous substances over wounds. In the study by Jain M *et al.*^[5] 56.2% cases, indigenous substances like lime and chili powder were applied over wounds.

In the present study, most cases (52.90%) reported to ARV clinic between 2nd–3rd day of animal bite & 30.32% were reported within 1 day. Jain M *et al.*^[5] reported that 64.9% of cases have attended ARV clinic within 24 hours, while another 28.5% cases attended between 24–48 hours and 6.6% cases after 48 hours of animal bite.

On seeing the association between education and practices after bite in a study population, it was found that intermediate, graduate or above preferred to wash the wound with soap and water more than other groups.

It was found to be significant when applying the Chi-square test to know the significance level of practices after bite with education status.

CONCLUSION

- Males had higher incidence of bite than females, which might be due to increased outdoor activity and mobility and hence have increased risk of exposure to bite.
- Children are more vulnerable for animal bite because of their nature of provoking dogs and in turn get attacked.
- Of all animal bites, 77.43% were category III, implying that

most bites are severe and require immunoglobulin.

- Around 74.19% of animal bites were related to stray animals and site of bite was lower limb in most cases.
- Most of the victims reached the antirabies clinic without having even washed the wound.

RECOMMENDATION

- As majority of the animal bite victims were students, most of them were unaware about the importance of wound care, therefore, a step can be taken to create awareness at the level of schools.
- As many victims failed to afford for immunoglobulin; therefore provision should be made for the availability of immunoglobulin free of cost along with vaccine by the Government.
- Many people also don't know about the importance of rabies immunoglobulin; they should be made aware through counseling.

LIMITATIONS

This study was conducted only in the patients attending the outpatient department in the antirabies clinic of BRD Medical College, Gorakhpur.

ETHICAL APPROVAL

Ethical approval for this study was obtained from the Institutional Ethical Committee of BRD Medical College, Gorakhpur, Uttar Pradesh, India. Participation in the study was voluntary. Written informed consent was obtained from each participant and the anonymity of the participants was maintained.

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Nil.

CONFLICTS OF INTEREST

There are no conflicts of interest.

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