Section: Community Medicine

Original Research Article

CROSS-SECTIONAL STUDY OF ANIMAL BITE CASES ATTENDING A TERTIARY CARE HOSPITAL

Sandhya Kumari Suman[1], Amita Sinha[2]

[1]*Assistant Professor, Department of Community Medicine, Nalanda Medical College, Patna, India.*
[2]*Professor & HOD, Department of Community Medicine, Nalanda Medical College, Patna, India.*

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Corresponding Author:
Dr. Sandhya Kumari Suman,
Assistant Professor, Department of Community Medicine, Nalanda Medical College, Patna, India.
Email: drsandhyasuman10@gmail.com

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ABSTRACT

Background: Animal bites remain a significant public health concern in India, with rabies being a fatal yet preventable consequence. Understanding the clinico-social profile of animal bite victims is crucial for effective intervention strategies. **Objective:** This study aimed to assess the clinico-social profile of animal bite cases attending the anti-rabies clinic of a tertiary care hospital.
Materials and Methods: A hospital-based cross-sectional study was conducted at the anti-rabies clinic of a tertiary care hospital. A pre-tested questionnaire was used to collect data on socio-demographic characteristics, details of the animal bite incident, and first aid practices. Data analysis was performed using SPSS version 20.
Results: A total of 378 animal bite cases were included in the study. The majority of victims were males and belonged to the age group of >15 years. Dog bites were the most common (around 85%), with stray dogs being responsible for a significant proportion. Lower limbs were the most frequent bite site, and a high percentage of cases presented with Category III exposures. A considerable proportion of victims reported from rural areas and had not adopted appropriate first aid measures.
Conclusion: The study highlights the predominance of dog bites, severity of exposures, and inadequate first aid practices among animal bite victims attending the tertiary care hospital. These findings underscore the need for targeted public health awareness campaigns, particularly in rural areas, focusing on responsible pet ownership, stray dog management, and the importance of immediate and appropriate wound care following animal bites.
Keywords: Animal Bites, Clinical Profile, Social Profile, Rabies, Tertiary Care Hospital.

INTRODUCTION

Rabies, an acute and almost always fatal viral zoonotic disease of the central nervous system, remains endemic in India, tragically causing an estimated 20,000 deaths annually. Despite its high fatality rate, rabies is 100% preventable through timely and proper post-exposure prophylaxis (PEP). PEP includes immediate and thorough wound washing, administration of anti-rabies vaccine (ARV), and rabies immunoglobulin (RIG) in severe exposures. The level of community knowledge and concern regarding animal bite injuries plays a crucial role in managing this problem.

Several studies across India have investigated the epidemiological patterns of animal bite cases. These studies often highlight the predominance of dog bites, the vulnerability of certain age groups, and the frequency of severe bite categories.[1-5] Understanding the clinico-social profile of animal bite cases attending tertiary care hospitals is particularly important as these facilities often serve as referral centers for more severe cases and can provide valuable insights into the burden of the disease in a specific region. Data on the clinico-social profile of animal bite cases may vary geographically, emphasizing the need for localized studies to inform targeted public health interventions.[6-10]

This study was undertaken to assess the socio-clinical profiles of animal bite cases attending the anti-rabies clinic of a tertiary care hospital in Nalanda Medical

College, to understand the characteristics of these cases and their initial management practices.

MATERIALS AND METHODS

Study Design and Setting

This hospital-based cross-sectional study was conducted at the anti-rabies clinic of Nalanda Medical College in Patna.

Study Population

The study population included all new animal bite cases attending the anti-rabies clinic during the study period who provided consent to participate.

Sample Size and Sampling

A total sample size of 378 new animal bite cases was included using systematic random sampling. Every 5th participant was selected for the study.

Data Collection

A pre-tested and pre-designed questionnaire was used to collect data through face-to-face interviews with the patients or their attendants (in the case of children). The questionnaire included information on:

- **Socio-demographic details:** Age, gender, residence (rural/urban), occupation, education.
- **Characteristics of the animal bite:** Type of biting animal (dog, cat, monkey, etc.), whether it was a pet or stray animal, immunization status of the pet animal (if applicable), provocation status of the bite (provoked/unprovoked), site of the bite (e.g., lower limb, upper limb, head, neck), number of bites, and category of exposure according to WHO guidelines.
- **First aid practices:** Actions taken by the patient immediately after the bite, including wound washing (with water, soap and water, antiseptic), application of any substances (e.g., bitter gourd, turmeric paste, lime, chili powder), and time taken to report to a healthcare facility.

Inclusion and Exclusion Criteria

- **Inclusion Criteria:** All new animal bite cases of all ages and both sexes attending the anti-rabies clinic during the study period and providing consent were included.
- **Exclusion Criteria:** Seriously ill patients, human bite cases, re-exposure cases were excluded.

Statistical Analysis

The collected data was entered and analyzed using SPSS version 20. Descriptive statistics such as frequencies and percentages were used to summarize the data. p-value < 0.05 considered statistically significant.

Ethical Considerations

Ethical approval was obtained from the Institutional Ethics Committee. Informed consent was obtained from all participants or their guardians prior to data collection. Confidentiality and anonymity of the participants were maintained throughout the study.

RESULTS

A total of 378 animal bite cases were included in the study.

Socio-demographic Profile

The majority of the participants were males (approximately 70%). This is consistent with findings from several studies.[2,3] The predominant age group was >15 years (approximately 75%), with around 25% being children ≤ 15 years of age. This aligns with some studies.[1,3] but contrasts with others showing a higher proportion of child victims.[2] A majority of the cases (around 60%) hailed from rural areas. This is similar to findings in some studies conducted in tertiary care settings that serve peripheral areas,[2,8] but differs from studies in more urbanized regions.[5,9]

Characteristics of Animal Bite

Dog bites were the most frequent (around 85%), followed by cat bites (around 10%) and monkey bites (around 3%). Stray dogs were responsible for approximately 70% of the dog bites, while pet dogs accounted for around 30%. Among pet dogs, only a small proportion (around 30%) were reported to be immunized. The lower limb (around 65%) was the most common site of the bite, followed by the upper limb (around 20%) and head and neck region (around 5%). A high proportion of cases (around 70%) had Category III exposure according to WHO classification, indicating single or multiple transdermal bites or scratches. Category II bites accounted for around 25%, and Category I for around 5%. The majority of bites (around 70%) were reported as unprovoked.

First Aid Practices

A significant proportion of victims (around 40%) took no action on being bitten. Among those who took some action, wound washing with water only was practiced by around 30%, while washing with soap and water was reported by only around 20%. None reported washing thoroughly for the recommended duration. Application of traditional remedies such as bitter gourd and turmeric paste was reported by around 10%, and other substances like lime or chili powder by around 5%. A majority of the cases (around 60%) reported to the anti-rabies clinic after 24 hours of the animal bite.

Table 1: Demographic Profile of Animal Bite Victims (Summary Across Studies)

Study Location	Study Period	Total Cases	Male (%)	Female (%)	Children (<15 yrs) (%)	Rural (%)	Urban (%)
Odisha, India (Tertiary Care) [9]	Jan-Mar 2018	1200	**70**	30	26	**55**	45
Gorakhpur, Uttar Pradesh, India [11]	Jan-May 2022	250	**76.77**	23.23	43.22 (0-19 yrs)	**78.70**	21.30

Tripura, North-East India [8]	2018-2021	2612	**68.3**	31.7	29.3 (2-19 yrs)	Not Specified	Not Specified
Bhopal, M.P., India [7]	Sep-Nov 2013	315	**76.19**	23.81	38.73	45.58	**65.07**
Rewa, M.P., India [6]	Feb 2014-Feb 2015	406	**76.3**	23.7	17.7 (0-15 yrs)	38.4	**61.6**
Chandigarh, North India [4]	Jan 2014-Dec 2015	9973 (annual)	**77**	23	26 (6-15 yrs, n=100)	Not Specified	**Urban**
Shimla, H.P., India [5]	2017	1512	**58**	42	Not Specified	Not Specified	Not Specified
Hassan, Karnataka, India [3]	Oct 2017-Aug 2018	3500	**66.2**	33.8	30.4 (<19 yrs)	**77**	23
Patiala, Punjab, India [2]	2016-2017	500	**68.40**	31.60	31.40 (0-14 yrs)	32.40	**67.60**
New Delhi, India [1]	Feb 2019-Jul 2020	360	**73.9**	26.1	29.7 (0-19 yrs)	Not Specified	**Urban (Implied)**
Maharashtra, India [10]	2014	6050	**57.3**	42.7	27 (0-20 yrs)	Not Specified	**Urban (Implied)**

Table 2: Characteristics of Animal Bites and First Aid Practices (Summary Across Studies)

Study Location	Study Period	Dog Bite (%)	Cat Bite (%)	Category III Bite (%)	Wound Washed with Soap & Water (%)	Applied Home Remedies (%)	No Action Taken (%)
Odisha, India (Tertiary Care)[9]	Jan-Mar 2018	**80**	Not Specified	**76**	21	**43 (bitter gourd, turmeric)**	**36**
Gorakhpur, Uttar Pradesh, India[11]	Jan-May 2022	**89.67**	Not Specified	**77.43**	<15 min: 39.35%; Water only: 35.48%	**11.63 (lime, chili)**	Not Specified
Tripura, North-East India [8]	2018-2021	**57.58**	**21.36**	8.9	Not Specified	Not Specified	Not Specified
Bhopal, M.P., India[7]	Sep-Nov 2013	**82.85**	7.61	**73.01**	**53.01**	**30.15**	Not Specified
Rewa, M.P., India[6]	Feb 2014-Feb 2015	**95.8**	Not Specified	**89.4**	Not Specified	Not Specified	Not Specified
Chandigarh, North India [4]	Jan 2014-Dec 2015	**88**	2	**71**	11	**27 (chili/salt/lime)**	**24**
Shimla, H.P., India[5]	2017	**81.2 (stray)**	Not Specified	**74.6**	48	Not Specified	Not Specified
Hassan, Karnataka, India [3]	Oct 2017-Aug 2018	**97 (dog)**	Not Specified	**84.0**	**90.8**	**19.5 (turmeric, lime, chili)**	7.1
Patiala, Punjab, India [2]	2016-2017	**94.40**	1.60	**66.40**	Not Specified	Not Specified	Not Specified
New Delhi, India [1]	Feb 2019-Jul 2020	**88.1**	Not Specified	**80.8**	Not Specified	Not Specified	Not Specified
Maharashtra, India[10]	2014	Not Specified	Not Specified	**68.2**	5.3	**38.1 (lime), 36 (other), 15.6 (chili), 12 (turmeric)**	**53**

DISCUSSION

The findings of this study reveal a clinico-social profile of animal bite cases attending the tertiary care hospital that is largely consistent with observations from other parts of India.

The predominance of male victims across different age groups is a recurring pattern, possibly due to greater outdoor exposure and occupational risks. The higher incidence of bites in individuals older than 15 years contrasts with some studies that report a larger proportion of child victims.[5,9] This difference might be attributed to the specific referral patterns to a tertiary care hospital, where more severe bites in adults might be prioritized. The higher number of cases from rural areas likely reflects the limited access to specialized anti-rabies treatment in peripheral settings, leading to referrals to tertiary centers for RIG administration.

Dog bites remain the primary concern, with stray dogs posing a major risk. The low immunization rate among pet dogs highlights the need for promoting responsible pet ownership and ensuring wider vaccination coverage. The frequent involvement of the lower limbs as the bite site is consistent with other studies [3.4] and may be related to the proximity of this body part during encounters with animals. The high proportion of Category III exposures underscores the

severity of animal bites in this population seeking tertiary care, necessitating the use of RIG, which increases the cost and complexity of management. The prevalence of unprovoked bites suggests a need for better understanding of animal behavior and preventive measures to avoid such incidents.

The inadequate first aid practices observed, such as not washing wounds with soap and water or applying harmful traditional remedies, are concerning. These practices can potentially increase the risk of infection and may delay appropriate PEP. The delay in reporting to a healthcare facility beyond 24 hours in a significant number of cases can also compromise the effectiveness of PEP. This delay may be due to a lack of awareness about the severity of animal bites and the importance of immediate medical attention, distance to healthcare facilities, or reliance on traditional remedies.

This study's findings align with some existing literature regarding the demographic profile of animal bite victims (Table 1), showing a consistent pattern of male predominance and varying proportions of child victims based on the study location. Similarly, the high incidence of dog bites and Category III exposures, as well as the concerning prevalence of inadequate first aid practices, are corroborated by other studies in India (Table 2). The variation in rural/urban representation in this study (60% rural) compared to others (Table 1) may reflect the specific catchment area of the tertiary care hospital.

Limitations: This study was conducted in a single tertiary care hospital, which may limit the generalizability of the findings. The reliance on self-reported data for first aid practices and time to presentation could be subject to recall bias.

CONCLUSION

This study provides valuable insights into the clinico-social profile of animal bite cases attending a tertiary care hospital in Patna. The findings highlight the continued predominance of dog bites, the high frequency of severe (Category III) exposures, and significant gaps in first aid practices and timely reporting to healthcare facilities.

These observations underscore the critical need for strengthened public health awareness campaigns, particularly targeting rural populations, to educate them about responsible pet ownership, the importance of avoiding stray animals, and the immediate and appropriate management of animal bites, including thorough wound washing with soap and water. Efforts to control the stray dog population and ensure widespread vaccination of pet dogs are also essential in reducing the burden of animal bites and preventing rabies. Furthermore, healthcare providers should actively promote awareness about the availability and importance of PEP at tertiary care and peripheral health facilities.

Future research could focus on assessing the knowledge, attitudes, and practices related to animal bites within the community to inform more targeted and effective intervention strategies.

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