

Original Research Article

Socio-clinical profile of animal bite cases with re-exposure attending anti-rabies clinic of a tertiary care hospital of southern Odisha: a cross-sectional study

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Received: 20 June 2025

Revised: 06 August 2025

Accepted: 11 August 2025

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ABSTRACT

Background: Rabies is a zoonotic disease which is 100% fatal. Re-exposure to animal bites carries the same risk if not treated properly. Hence studying the socio-clinical profile of re-exposure cases is crucial to raise awareness and prevent further risk. Objectives were to study the socio-clinical profile of re-exposure cases of animal bite, to find out the pattern and to determine the factors associated with frequent re-exposures.

Methods: It was a hospital based cross sectional study conducted over a period of three months from May to July of 2022. Animal bite patients attending ARC of MKCG MCH, Berhampur, Odisha with documentation of previous animal bite exposures within 5 years were included in the study. Data was collected by a pre-designed pre-tested questionnaire through kobo toolbox and analysed by SPSS v 17.

Results: A total of 81 animal bite cases with re-exposure were selected purposively during the study period. Among them 59.3% were males and 74% were from urban areas. Around 36% were re-exposed repeatedly within 5 years (more than one re-exposure). Association of frequent re-exposures with gender, provocation history and type of animal was found to be statistically significant ($p < 0.05$). Provoked animal bite cases were at 4.7 times more risk to develop frequent re-exposures than unprovoked cases.

Conclusions: Reduction in incidence of paediatric animal bites requires educating both children and parents about animal bite exposure. However, education alone is unlikely to prevent animal bites. Environmental and policy measures such as breeding pets for temperament and appropriate socialization are also necessary.

Keywords: Animal-bite, Re-exposure, Socio-clinical, Southern Odisha

INTRODUCTION

Rabies is a vaccine-preventable viral zoonosis which occurs in more than 150 countries.¹ Though it is vaccine preventable, it remains a public health issue in the developing countries which is known from the fact that globally this devastating illness is responsible for more than 60,000 human deaths, while roughly 15 million people receive rabies post-exposure prophylaxis (PEP) annually.² It is well established that the high Rabies burden in some developing countries like India basically arises from the high incidence of animal bites and the failure to initiate

and complete anti-rabies vaccination in a large proportion of the animal bite cases.³ The incidence of animal bites is 17.4 per 1000 population.⁴ Re-exposure to animal bite is common with an incidence up to 15% in rabies endemic areas like India. Many of these repeated exposures occur in persons who have received PEP against rabies. But the real burden of re-exposure in our country is not precisely known. Re-exposure to animal bite is a short form of repeated exposures. In cases of re-exposure, the patient, in the past has suffered at least once for which the consultation is sought.⁵ In a high rabies burden country like India, there exists a large at-risk population due to the

permissive social environment promoting human-animal interaction in densely populated urban areas with huge stray canine population and an overwhelming lack of formal dog ownership.⁶ Re-exposure following PEP with a nerve tissue vaccine (NTV) or if previous PEP or PrEP is not clearly documented- should be treated as a fresh unvaccinated case. If the animal bite patient has documented proof of complete PEP or PrEP within last 3 months, then adequate wound washing would be enough in case of re-exposure, but no vaccine or RIG is needed in such cases.⁷ Moreover, patients should also be instructed to preserve their medical records documenting their ARV (PEP) vaccination status and present them in the event of subsequent re-exposures.³ The threat of infection is higher in those cases if not treated duly. Hence it is important to study the socio-clinical profile of re-exposure cases to make the population aware and prevent its further risk.

Objectives

To study the socio-clinical profile of re-exposure cases of animal bite. To find out the pattern and to determine the factors associated with frequent re-exposures.

METHODS

A hospital based cross sectional study was conducted at Anti rabies clinic (ARC) of MKCG MCH, Berhampur, from May to July of 2022 among re-exposed animal bite patients with documentation of previous exposures within last 5 years.

Ethical approval was obtained from institutional ethics committee prior to the study. Purposive sampling method was used to select the study participants.⁸ Informed consent from participants and in paediatric cases, assent from the parents or guardians accompanying the child was taken. The re-exposure cases who did not give consent were excluded from the study.

A total of 81 animal bite cases with re-exposure were taken out of 2053 animal bite cases during the study period. Socio-demographic profile, clinical profile of animal bite and re-exposure history were obtained using a pre-designed pre-tested semi-structured questionnaire through Kobo-toolbox software.⁹

Data was analysed by using SPSS V 17 and Microsoft Excel using appropriate tests of significance (proportion, mean, chi square test or Fisher exact test and logistic regression) etc.¹⁰

RESULTS

Sociodemographic profile of the study participants showed that 37% of the participants belonged to the age category of 0-19 years which was followed by the participants in the age group of 20-40 years. As the age of the participants increased, there was a decline in number

of re-exposures to animal bite. Most of the participants were males (59.3%), while females constituted 40.7% of the study population. Among them 74% were from urban areas (Table 1). Provocation history of the participants showed that 53% of the animal bite cases were provoked animal bites (Figure 1). The most common site of bite was upper limb (53%). Pet animal bites were 47% followed by stray animal bites which was around 40%. The category of wound among the re-exposure cases showed that almost all (93.8%) wound belonged to category III, which was followed by category II and I (5% and 1.2% respectively) which were very minimal (Figure 2).

Table1: Sociodemographic profile of the study participants (n=81).

Variables	Category	Frequency (%)
Age (years)	0-19	30 (37)
	20-40	26 (32)
	41-60	22 (27)
	>60	03 (4)
Gender	Male	48 (59.3)
	Female	33 (40.7)
Residence	Urban	60 (74)
	Rural	21 (26)
Education	Illiterate	5 (6.2)
	Primary	6 (7.4)
	Secondary	8 (9.9)
	High school	35 (43.2)
	Graduate and above	27 (33.3)

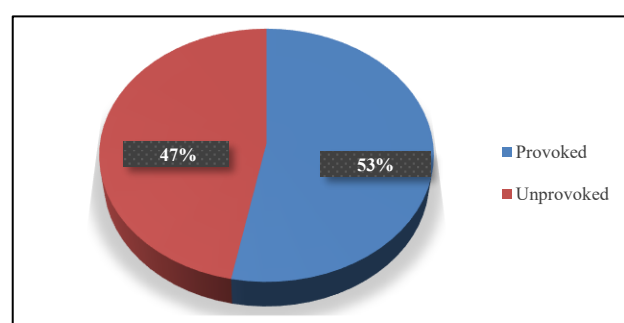


Figure 1: Provocation history (n=81).

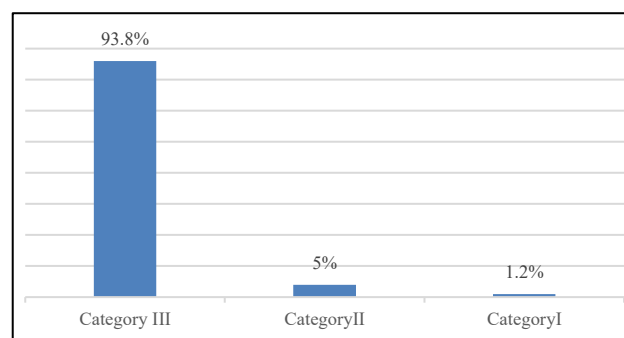


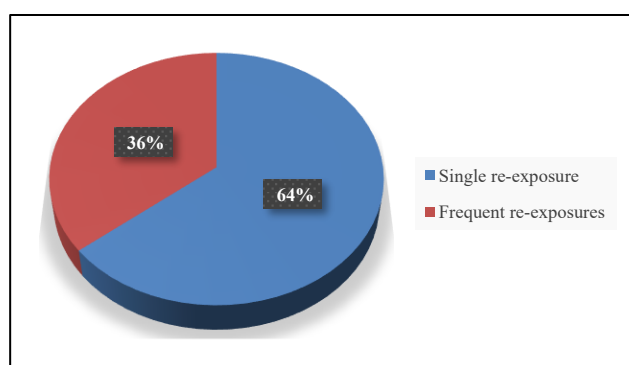
Figure 2: Category of wound among re-exposure cases (n=81).

Table 2: Association of socio-clinical profile with frequent re-exposures (n=81).

Variables	Single re-exposure (%)	Frequent re-exposures (%)	P value
Age in years			
0-19	12 (46.2)	14 (53.8)	0.13
20-40	23 (74.2)	8 (25.8)	
41-60	15 (71.4)	6 (28.6)	
>60	2 (66.6)	1 (33.3)	
Place			
Rural	17 (81)	4 (19)	0.06
Urban	35 (58.3)	25 (41.7)	
Gender			
Female	17 (51.5)	16 (48.5)	0.04
Male	35 (73)	13 (27)	
Education			
Illiterate	4 (80)	1 (20)	0.65
Literate	48 (63.2)	28 (36.8)	
Provocation history			
Provoked	20 (44.4)	25 (55.6)	0.00
Unprovoked	32 (88.9)	4 (11.1)	
Type of animal			
Pet	13 (34.2)	25 (65.8)	0.00
Stray	29 (87.9)	4 (12.1)	
Wild	10 (100)	0 (0)	
Category of wound			
I	1 (100)	0 (0)	0.67
II	3 (75)	1 (25)	
III	48 (63.2)	28 (36.8)	

Table 3: Factors associated with frequent re-exposures according to binary logistic regression.

Factors	P value	95%CI (lower-upper)	AOR
Provocation history			
Provoked	0.025	1.218-18.348	4.7
Unprovoked (reference)			

**Figure 3: Frequency of re-exposures among participants (n=81).**

Around 36% of the participants were presented with frequent re exposures (more than one re-exposure) within 5 years (Figure 3). Association of frequent re-exposures with variables like gender, provocation history and type of animal was found to be statistically significant ($p<0.05$) (Table 2). Binary logistic regression of factors

associated with frequent re-exposures showed that provoked animal bite cases are at 4.7 times more risk to develop frequent re-exposures than unprovoked cases (Table 3).

DISCUSSION

In the present study mean age of the study participants was found to be 30 ± 18 years (mean $\pm$ SD). Mean gap between their exposures was 11 ± 9 months (mean $\pm$ SD). A similar study by Ashe et al found the mean age of the incident cases with the previous animal-bite exposure (26.84 ± 15.63) and without exposure (28.03 ± 17.07) was not significantly different ($p=0.683$).¹¹ Among the study participants 37% belonged to paediatric age group with provoked history of animal bites mostly by pets which was similar to the findings of Ashe et al.¹¹ This could be probably due to the playfulness, less defensiveness and carelessness of the children. Men (59.3%) were affected more than females in our study where as in a study conducted by Basu et al, 70.9% were male, and 29.1% were female and the median age of the participants was

24 years.³ Around 74% were from urban areas. 6% of the participants were illiterate. Major type of wounds was of category III animal bites (93.8%). Around 36% of the participants were presented with frequent re-exposures within 5 years. There was a significant association found between gender, provocation history and type of animal with frequent re-exposures. Among the provoked animal bite cases around 55.6% and among pet animal bite cases 65.8% were associated with frequent re-exposures. 75% of the pets were immunised. The provoked animal bite cases are at 4.7 times higher risk than the unprovoked ones to have frequent re-exposures. In a previous study by Sachdeva et al around 80.5% of the bites were inflicted by stray animals, among which 70% of cases were by stray dogs. Precisely, 97.7% of cases took anti-rabies vaccine as similar to our study (97%). 33.2% of victims were category III cases but out of them only 46% got local infiltration of immunoglobulin. The association of time lag between bite and reporting to the health facility with socio-economic status, residence, and education was found to be statistically significant.¹² As mentioned by Jakeman et al, policies that support environmental changes need to be developed such as provision of pets less likely to bite through breeding for temperament and appropriate socialisation.¹³

The findings of the study may not be generalisable to the entire population being a single centre study.

CONCLUSION

Most of the cases belonged to paediatric age group with category III provoked animal bites. Population having pets were re-exposed frequently. They must be careful while handling their pets. Few participants were incompletely vaccinated due to lack of awareness about importance of anti-rabies vaccination. People must be aware of the serious consequences of frequent animal bite exposures. Pet owners must vaccinate their pets and must learn how to be safe around animals. Community engagement regarding rabies should be an integral to the vaccination projects. Careful exploration of the circumstances of bite occurrence is essential to make safeguarding decisions and prevent future bites. Reduction in incidence of paediatric animal bites requires education of both children and parents about animal bite. Child-dog interactions must be highly supervised. However, education alone is unlikely to prevent animal bites. Environmental and policy measures such as breeding pets for temperament and appropriate socialization are also necessary.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Rabies. Available from: <https://www.who.int/news-room/fact-sheets/detail/rabies>. Accessed on 7 May 2024.
2. Singh R, Singh KP, Cherian S, Saminathan M, Kapoor S, Manjunatha Reddy GB, et al. Rabies-epidemiology, pathogenesis, public health concerns and advances in diagnosis and control: a comprehensive review. *Vet Q*. 2017;37(1):212-51.
3. Basu S, Mariam W, Santra S, Garg S, Singhal R. Re-exposure animal bite management among incident animal bite cases in a secondary care hospital in Delhi, India. *Indian J Public Health*. 2020;64(1):72.
4. Barwal V, Sharma G. IAPSM's Textbook of Community Medicine. *Int J Community Med Public Health*. 2019;6.
5. Agarwal A, Rajesh G, Vikas S. A cost evaluation analysis of treatment strategy in re-exposure animal bite cases. *Int J Adv Community Med*. 2018;1:23-6.
6. Abbas SS, Kakkar M, Rogawski ET. Costs analysis of a population level rabies control programme in Tamil Nadu, India. *PLoS Negl Trop Dis*. 2014;8(2):e2721.
7. Guideline for animal bite management guideline for animal bite management and frequently asked questions. National rabies control programme national rabies control programme. Available from: https://www.wbhealth.gov.in/uploaded_files/IDSP/Guideline_for_Animal_Bite_Management_FAQ-2021.pdf. Accessed on 16 May 2024.
8. Campbell S, Greenwood M, Prior S, Shearer T, Walkem K, Young S, et al. Purposive sampling: complex or simple? Research case examples. *J Res Nurs*. 2020;25(8):652-61.
9. Olajide V. Data Collection with KoboToolbox. 2019. Available from: https://www.researchgate.net/publication/335147345_Data_Collection_with_KoboToolbox. Accessed on 16 May 2024.
10. Saha I, Paul B. Essentials of biostatistics and research methodology. 3rd Edition. Academic Publishers; 2020.
11. Ashe S, Behera TR, Routray D, Giri R. Documentation on of anti-rabies vaccination could prevent vaccine wastage: a cross-sectional study. *APCRI J*. 2019;21(1):65-70.
12. Sachdeva A, Vinay, Kumar T, Yadav G, Tondwal J. Epidemiological profile and management practices of animal bite cases in a tertiary care hospital of Haryana: A cross-sectional study. *J Fam Med Prim Care*. 2022;11(12):788690.
13. Jakeman M, Oxley JA, Owczarczak-Garstecka SC, Westgarth C. Pet dog bites in children: management and prevention. *BMJ Paediatr Open*. 2020;4(1):e000726.

Cite this article as: Sahoo S, Satapathy DM, Rath T, Sahu P. Socio-clinical profile of animal bite cases with re-exposure attending anti-rabies clinic of a tertiary care hospital of southern Odisha: a cross-sectional study. *Int J Community Med Public Health* 2025;12:4046-9.