Title: A PROFILE OF ANIMAL BITE CASES REPORTING AT EMERGENCY DEPARTMENT OF TERTIARY CARE HOSPITAL IN GOA, INDIA: A RETROSPECTIVE RECORD BASED STUDY

Author: N Y Dhupdale [1], A K Sawant [2], J A Cacodcar [3]

1. Lecturer
2. Junior Resident
3. Professor and Head of the Department

Department of Preventive and Social Medicine, Goa Medical College, Bambolim, Goa

Keywords Animal bites, dog bites, Goa, patient profiles, post-exposure prophylaxis, rabies

Abstract It is estimated that the incidence of animal bites in India is 1.7% (or 17 per 1000 persons). These bites could be caused by rabid animals. Rabies is an endemic, highly fatal disease in India and other 150 countries, which is also a vaccine preventable disease. The objective of this study is to describe the profile of animal bite cases reporting at the Emergency Department (ED) of a tertiary care hospital in Goa

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Methods: A retrospective record based study design was used to conduct this study. The treatment registers available at the ED of Goa Medical College and hospital at Bambolim, Goa were used as source of data. All animal bite cases who visited the ED over last one year for treatment from June 2016 till May 2017 were included in the study.

Results: A total of 512 cases of animal bites had reported at the Emergency Department of Goa Medical College and Hospital from June 2016 up to May 2017. Majority of them were men (71.9%) as compared to women (28.1%). As a part of post-exposure prophylaxis against dog-mediated rabies 95.8% received Anti Rabies vaccine (ARV), and only 10.9% received Anti Rabies Serum (ARS). Whereas, 87.1% received Tetanus Toxoid (TT).

Conclusions: Animal bites constitute a common medical emergency at ED of Tertiary Care Hospital in Goa. Dogs (84.4%), cat (2.5%) and rat (1.0%), were the most common animals associated with bites among humans. Young adult males are often animal bite victims than females. Majority (97.8%) patients received ARV, however ARS were underutilized when indicated. TT was administered to all dog bite cases.

Original Article

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ABSTRACT:

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INTRODUCTION:

Animal bites cause a big burden in terms of morbidity and mortality throughout the world. As per the World Health Organization (WHO), the dog bites is a cause for tens of millions of injuries annually, followed by snake bites (5 million), cat bites (250%) and Monkey bites (221%) of animal bite injuries globally.[1] These bites could be caused by rabid animals. Rabies is an endemic, highly fatal disease in India and other 150 countries, which is also a vaccine preventable disease. It is fatal after the onset of clinical symptoms.[2] It is estimated that globally dog-mediated rabies is responsible to almost 59,000 human deaths. Almost 3.7 million disability-adjusted life years (DALYs) and 8.6 billion USD are lost on annual basis due to dog mediated rabies.[3] As per some authors, in Asia, 3 billion people are affected by rabid dog bites, which has led to 30,000 deaths every year which implies that, someone is dying every 15 minutes.[4] The annual incidence of animal bites in India is 1.7% (or 17 per 1000 persons), rural areas had more incidence (1.8%).[5] The estimated incidence of rabies in India is 2.74 cases per 100 000 people annually.[6] India reports around 18000 20000 rabies cases and accounts for 36% of global rabies deaths.[7] In India, dog bites are responsible for the transmission of Rabies in a range from 69.5% - 97.1% of cases as reported by many renowned experts on the rabies.[8,9,4] In India, rabid dogs often go on the biting spree and bite many people at the same time.[9] Almost two decades ago, the rabies cases were managed by specialized health care units called as Infectious Diseases (ID) hospitals which were managed by state government.[10] Goa had one such hospital which has been recently upgraded to sub-district hospital which is located at Ponda in Goa.

Although a lot of research on the rabies is carried out in India, however there remains a big gap between research and the policy.[10] Government of India has taken serious policy decision to control this dreaded disease and has launched National Rabies Control Programme in 2014.[10,11] Association for Prevention and Control of Rabies in India (APCRI) has also pledged its support to achieve the goal of rabies free India by 2030.[9]

In Goa, some non-governmental organizations have come together to make Goa rabies free by 2018. This collaboration along with the Government of Goa have led to vaccination of 20 000 Dogs in 2014 and 180 000 dogs in 2015-16 and has been instrumental in bringing down the rabies deaths from 17 in 2014 to 5 and 1 in 2015 and 2016 respectively.[9]

The number of dog bites reported in the community

N Y Dhupdale, Lecturer, [2]A K Sawant, [2]Junior Resident, J A Cacodcar, Professor and Head, Department of Preventive and Social Medicine, Goa Medical College, Bambolim, Goa, India -403202. Corresponding author: Dr. Nitin Y Dhupdale, Lecturer, Department of PSM, Goa Medical College, Bambolim, Goa, India 403202. Phone: 832 2495191

based study[4] in the state of Goa approximately was 31.33%. The current study is conducted as a first step towards understanding the burden of animal bites reported at the Goa Medical College which is the only medical school in the state and caters to a large number of animal bites cases. The objective of this study is to study the profile of various animal bite cases which had reported at the ED for the year 2016-17.

MATERIALS AND METHODS:

A retrospective record based study design was used to conduct this study.The treatment registers available at the Emergency Department(ED)of Goa Medical College and Hospital at Bambolim, Goa were used as source of data. All animal bite cases who visited the ED over last one year for treatment from June 2016 till May 2017 were included for in the study. The variables collected for data analysis included the socio-demographic details, type of animals causing bites, seasonal variation in the animal bites was collected and post-exposure prophylaxis given to the patients. The study protocol was reviewed and approved by the Institutional Ethics Committee prior to data collection. The data was entered using EpiDATA software (version 3.1) and analysed by SPSS software (Version 18). Proportions and chi-square was used for analysing categorical variables. The p value <0.05 was considered as level of significance.

RESULTS:

A total of 512 cases of animal bites had reported at the Emergency Department of Goa Medical College and Hospital from June 2016 up to May 2017. Majority of them were men (71.9%) as compared to women (28.1%). The mean age was 35.96 ±15.947 years. Most of cases belonged to 16-60 years age group. (Table-1) Dog bites comprised of 84.4% of total animal bites reporting at the hospital. Snake bites were the second commonest animal bites reporting to the Hospital (11.5%).(Table-2)

Table 1:

Socio-demographic profile of study population

Variable	Groups	Frequency	Percentage
Age (years)	<15	27	5.3
	16-30	209	40.8
	31-45	131	25.6
	46-60	102	19.9
	61-75	38	7.4
	>76	5	1
Sex	Male	368	71.9
	Female	144	28.1
Taluka of patient	Tiswadi	339	66.2
	Bardez	40	7.8
	Ponda	26	5.1
	Murmugao	18	3.5
	Pernem	13	2.5
	Quepem	5	1.0
	Salcete	23	4.5
	Dharbandora	1	0.2
	Sattari	7	1.4
	Bicholim	11	2.1
	Outside Goa	28	5.5

Majority (66.2%) of the animal bite cases occurred among patients from Tiswadi block(Taluka) of Goa state. The most probable reason for this high proportion could be due to their proximity to Goa Medical College and Hospital, which is situated in the same block(Taluka). (Figure 1)

Table 2:

Type of animal causing bite and gender of patient

Type of animal	Gender of the patient		Total(%)
	Male(%)	Female(%)	
Dog	310 (84.2)	122 (84.7)	432(84.4)
Cat	8(2.2)	5(3.5)	13(2.5)
Rat	3(0.8)	2(1.4)	5(1.0)
Pig	2(0.5)	0	2(0.4)
Snake	45(12.2)	14(9.7)	59(11.5)
Scorpion	0	1(0.7)	1(0.2)
Total	368(100.0)	144(100.0)	512(100.0)

Pearson chi-square = 4.941, df=5, p=0.423

Figure 1: Map of Goa showing residences of animal bite cases reporting to hospital.[5]

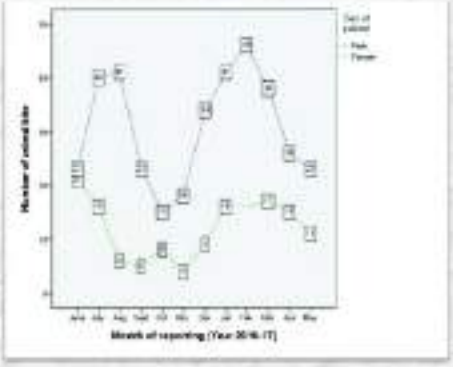
Table 3:

Type of Post exposure prophylaxis

Post exposure prophylaxis	Dog bites		Total (%)
	Yes(%)	No(%)	
Received Tetanus Toxoid	373(87.1)	55(12.9)	428(100.0)
Received Anti Rabies Vaccine	410(95.8)	18(4.2)	428(100.0)
Received Anti Rabies Serum	47(10.9)	383(89.1)	430(100.0)

As a part of post-exposure prophylaxis against dog-mediated rabies, 95.8% received Anti Rabies vaccine and only 10.9% received Anti Rabies serum. Around 87.1% received Tetanus Toxoid as a prophylaxis against tetanus toxoid. (Table 3)

Figure 2: Month wise reporting of animal bite cases



The month wise distribution of animal bite cases reporting to Hospital are depicted in the figure 2. It was noted that the animal bite trend was bimodal. The first peak was noted in the month of July and second was noted in the month of February. The probable explanation to this is the greater outdoor activities performed by the men during the end of rains and spring time.

DISCUSSION:

About 1.4 animal bite cases per day were reported at the ED of Goa Medical College and Hospital from June 2016 up to May 2017. Majority of them were men (71.9%) as compared to women (28.1%). Similar findings were reported by J Poorolajal et al[9]and B. R. Bariya et al[11]. The mean age was 35.96 ±15.947 years. Most of cases belonged to 16-60 years age group. Dog bites comprised of 84.4% of total animal bites reporting at the hospital, similar results were reported by J Poorolajal et al [9], P Umarigar et al[14], VSheetal et al[11], VShahet al[16], N R Masthet al[17], S A M Kularame[18], M Samanta[19].

Majority (66.2%) of the animal bite cases were from persons from Tiswadi Block (Taluka) of Goa state. The most probable cause could be due to their proximity to Goa Medical College and Hospital, which is situated in the same Block. (Figure 1)

As a post-exposure prophylaxis against dog-mediated rabies,95.8% received Anti Rabies vaccine and only 10.9% received Anti Rabies serum. (Table 2) In a study conducted by P Kulkarni et al[11] in Mysore reported that only 4.1% received ARV.In another study conducted by Sharma S et al[20] reported that 79.2% of dog bite cases received ARV.

Only 29.0% of dog bite cases received ARS, which was very low utilization. In another study by H Salve et al[21] reported that around 86% of dog bite patients received ARV.

As a part of post exposure prophylaxis against tetanus about 87.1% of study participants received Tetanus Toxoid. In a study carried out by T Behra et al [22]repoeted that 94% cases tetanus toxoid was given whereas S Sharma et al[20] reported that 78.1% received tetanus prophylaxis.

The month wise distribution of animal bite cases reporting to Hospital are depicted in the figure 2. It was noted that the animal bite trend was bimodal. The first peak was noted in July and second was noted in February. The probable explanation to this is the greater outdoor activities performed by the Men during the end of rains and spring time.

Strengths of the study

It is the first kind of record based study on the animal bites carried out at Goa Medical College Hospital. This study will be a precursor to develop a full-fledged prospective study on the details of dog mediated rabies.

Limitations of the study

This is a record based study using the in-house available records. The registers used for the capture of data are primarily not designed for the collection of data for research purposes. The errors of commission and omissions of the staff assigned with maintaining these records may be very difficult to identify and rectify. The most desirable pivotal data variables such as the time of bite, the category of bite, history of provocation for bite, etc. could not be obtained.

CONCLUSIONS:

Animal bites constitute a common medical emergency at ED of Tertiary Care Hospital in Goa. Dogs (84.4%), cat (2.5%) and rat (1.0%), were the most common animals associated with bites among humans. Young adult males are often animal bite victims than females. Majority (97.8%) patients received ARV, however ARS were underutilized when indicated. TT was administered to all dog bite cases. During the months of July and February, more bites are reported.

Recommendations

In spite of such a great number of animal bites reported at the Goa Medical college it does not have a separate Anti-Rabies Clinic to handle such cases. There is a need to create a separate clinic to handle such patients on priority basis as per WHO protocols. The usual method of ARV administration is intramuscular, it is

recommended that intradermal route may be used to reduce the cost and number of patient visits. Training of the medical and paramedical staff is required in intradermal vaccine administration to facilitate same at the Goa Medical Institutions.

Contribution of each authors:

NYD conceptualized the study, analysed the data and wrote the manuscript. AS did the data collection and manuscript writing. JAC helped in the manuscript writing and also gave assent to the final version of the manuscript.

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REFERENCES:

1. World Health Organization(WHO). WHO | Animal bites [Internet]. WHO. World Health Organization; 2013 [cited 2018 Jan 6]. p. 1. Available from: http://www.who.int/mediacentre/factsheets/fs373/en/
2. World Health Organization. Rabies Fact sheet [Internet]. Fact Sheet. World Health Organization; 2017 [cited 2018 Jan 5]. p. 1. Available from: http://www.who.int/mediacentre/factsheets/fs099/en/
3. Hampson K, Coudeville L, Lembo T, Sambo M, Kieffer A, Attlan M, et al. Estimating the Global Burden of Endemic Canine Rabies on behalf of the Global Alliance for Rabies Control Partners for Rabies Prevention. PLoS Negl Trop Dis. 2015;9(4):e0003709.
4. 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 Jan 23;37(1):212-51.
5. Sudarshan MK, Mahendra BJ, Madhusudana SN, Ashwath Narayana DH, Rahman A, Rao NSN, et al. An Epidemiological Study of Animal Bites in India: Results of A Who Sponsored National Multi-Centric Rabies Survey. J Commun Dis. 2006;38(1):32-9.
6. Baxter JM. One in a million, or one in thousand: What is the morbidity of rabies in India? J Glob Health. 2012;2(1):10303.
7. Kole AK, Roy R, Kole DC. Human rabies in India: a problem needing more attention. Bull World Health Organ. 2014 Apr 1;92(4):230-230.
8. Rani K. Demography of Rabies in India. World J Pharm Sci. 2017;5(2):15-12.
9. Maroof KA. Burden of rabies in India: The need for a reliable reassessment. Indian J Community Med. 2013;38(4):488-91.
10. Suraweera W, Morris SK, Kumar R, Warrell DA, Warrell MJ, Jha P. Deaths from Symptomatically Identifiable Furious Rabies in India: A Nationally Representative Mortality Survey. Zinsstag J, editor. PLoS Negl Trop Dis. 2012 Oct 4;6(10):e1847.
11. Mani RS, Anand AM, Madhusudana SN. Human rabies in India: an audit from a rabies diagnostic laboratory. Trop Med Int Heal. 2016 Apr;21(4):556-63.
12. Kulkarni P, Marulappa VG, Manjunath R. Clinico-epidemiological study of human rabies cases attending epidemic disease hospital Mysore city, Karnataka, India. Int J Community Med Public Heal. 2017;4(8):2823-6.
13. Kakkar M, Venkataramanan V, Krishnan S, Chauhan RS, Abbas SS. Moving from Rabies Research to Rabies Control: Lessons from India on behalf of Roadmap to Combat Zoonoses in India (RCZI) initiative. PLoS Negl Trop Dis. 2012;6(8):e1748.
14. Bagcchi S. India fights rabies: A new rabies-control programme in India aims to tackle the serious but under-recognised public-health burden caused by this disease. Lancet Infect Dis. 2015 Feb;15(2):156-7.
15. Times News Network. Anti-rabies programme rolled out in state - Times of India [Internet]. newspaper. 2014 [cited 2018 Jan 5]. p. 1. Available from: https://timesofindia.indiatimes.com/city/pune/Anti-rabies-programme-rolled-out-in-state/articleshow/45289664.cms
16. Sudarshan MK. Vision 2030: Dog-mediated human rabies-free India: Action must begin now. Indian J Public Health. 2017;61(1):1-2.
17. World Health Organization. WHO | Education programmes save lives from rabies in India [Internet]. WHO. World Health Organization; 2017 [cited 2018 Jan 5]. p. 1. Available from: http://www.who.int/features/2017/education-rabies-india/en/
18. Cacodcar JA, Bicholkar AU, Oliveira A, Mascarenhas V. Knowledge attitude and practices regarding animal bites and rabies in urban population of North-Goa. Int Multispecialty J Heal. 2017;3(12):2395-6291.
19. https://de.wikipedia.org/wiki/User:Chianwa. File:Administrative map of Goa.png - Wikimedia Commons [Internet]. Administrative map of Goa. 2014 [cited 2018 Jan 5]. p. 1. Available from: https://commons.wikimedia.org/wiki/File:Administrative_map_of_Goa.png#metadata
20. Pourmajid J, Rahmani L, Yousefi R, Farrasooh F. Animal Bite and Deficiencies in Rabies Post-Exposure Prophylaxis in Tehran, Iran. Arch Iran Med. 2015 Dec;18(12):822-6.
21. Bariya BR, Patel S V, Shringarpure KS. Comparison of compliance of animal bite patients to two different routes of post-exposure prophylaxis against rabies. Heal J Indian Assoc Prev Soc Med. 2015;6(1):305.
22. Umargar P, Parmar G, Patel PB, Bansal RK. Profile of animal bite cases attending urban health centres in Surat city: A cross-sectional study. Natl J Community Med. 2012;3(4):631-5.
23. Vyas S, Gupta K, Bhatt G, Tiwari H. Animal bite management practices: study at three municipal corporation hospitals of Ahmedabad. Natl J Community Med. 2010 Mar;1(2):75-8.
24. Shah V, Bala D V, Thakker J, Dalal A, Shah U, Chauhan S, et al. Epidemiological determinants of animal bite cases attending the anti-rabies clinic at V S General Hospital, Ahmedabad. Heal line. 2012;3(1):66-8.
25. Masthi NRR, Sudarshan MK. Understanding dynamics of animal bites and rabies prophylaxis in a rural community - An explorative study. APCRI J. 2013;14(2):9-11.
26. Kularatne SAM, Ralapanawa DMPUK, Weerakoon K, Bokalamulla UK, Abagaspitiya N. Pattern of animal bites and post exposure prophylaxis in rabies: A five year study in a tertiary care unit in Sri Lanka. BMC Infect Dis. 2015 Dec 4;16(1):62.
27. Samanta M, Mondal R, Shah A, Hazra A, Ray S, Dhar G, et al. Animal Bites and Rabies Prophylaxis in Rural Children: Indian Perspective. J Trop Pediatr. 2016 Feb;62(1):55-62.
28. Sharma S, Agarwal A, Khan AM, Ingle GK. Prevalence of dog bites in rural and urban slums of Delhi: A community-based study. Ann Med Health Sci Res. 2016;6(2):115-9.
29. Salve H, Kumar S, Rizwan SA, Rai SK, Kant S, Pandav CS. Feasibility of sustainable provision of intradermal post exposure prophylaxis against rabies at primary care level - evidence from rural Haryana. BMC Health Serv Res. 2014;14(1):278.
30. Behera TR, Mohapatra G, Rout R. A study on prescription analysis of referral dog bite cases to anti rabies clinic of M.K.C.G. Medical College, Berhampur, India. South East Asia J Public Heal. 2017;7(1):3-14.