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Original Research Article

A cross sectional study on pattern of animal bites and their post exposure management in a tribal district of Mayurbhanj, Northern Odisha, India

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ABSTRACT

Background: Rabies is an enzootic and epizootic disease of worldwide. Rabies is a fatal but preventable viral disease. Rabies is one of the neglected tropical diseases that predominantly affects poor and vulnerable populations who live in remote rural locations. Objectives of current study was to assess the prevalence of animal bite cases and its associated factors in a tribal district of Northern Odisha and to study the first aid management of people after dog bite.
Methods: It was a cross sectional study. This study was conducted at PRM medical college, Baripada, Odisha in anti-rabies vaccination (ARV) OPD clinic. The study period was March 2021 to September 2021. The sampling techniques was consecutive sampling. The study population was all animal bite case attending ARV clinic. Data was analyzed by appropriate statistical tool.
Results: Majority 54.9% victims are dog bite victims and the most common site of bite was lower limb (53.6%). The main source of information was family and friends followed by doctors and health workers.
Conclusions: Majority of people especially in rural and tribal area were illiterate and they don't have any knowledge about animal bite or its management. This study had found that those who are literate had done a proper wound management before coming to ARV clinic. So, literacy proved to have a major impact on wound management. Behavior changes communication (BCC) along with health education is a vital weapon for controlling rabies especially in developing country like India.

INTRODUCTION

Animal bites are major public health concern in worldwide and may be associated with significant morbidity. Rabies is a vaccine-preventable, zoonotic, viral disease. It's a disease of warm-blooded animals. Rabies is a highly fatal disease caused by Lyssavirus type 1 belonging to the Rhabdoviridae family. The disease is transmitted through saliva from infected animals to human beings by means of bites, scratches, licks on broken skin and/or mucous membrane.[1] Rabies is a vaccine-preventable viral disease which occurs in more than 150 countries and territories which causes tens of thousands of deaths every year, mainly in Asia and Africa and 40% of whom are children under 15 years of age.[2] The number of human deaths globally due to dog-mediated rabies is estimated to be 59 000 annually, with an associated loss of 3.7 million DALYs. Dog-mediated rabies as the major cause of human rabies (disability-adjusted life year).[3] Human rabies continues to be endemic in India and according to recent estimate 20,000 persons die of this disease every year.[4]

Rabies is one of the neglected tropical diseases (NTD) that predominantly affects poor and vulnerable populations who live in remote rural locations. Approximately 80% of human cases occur in rural areas. (WHO, 2021) .Rabies is the 10th biggest cause of death due to infectious disease worldwide.[5] Rabies is a significant health concern following dog bites, cat bites and monkey bites. In India, about 98% of animal bites are caused by bite of dogs and cat.[6,7] The people get infected followed by bite, scratch, lick or broken skin or when saliva of infected animal comes into direct contact with human mucous or any fresh skin wounds. In India, every 30 minutes, someone dies from rabies.[8] Rabies though 100% fatal is but its 100% preventable.[9] For the management and control WHO recommended post-exposure prophylaxis categorization which includes wound wash, anti-rabies vaccination (ARV) and rabies immunoglobulin. The intramuscular anti-rabies vaccine consists of 'Essen' regimen - one dose 0, 3, 7, 14 and 28 days and 'Zagreb' regimen 0, 7 and 21 days in which two doses are administered on the first day and one dose on other days. In India, since 2006, intradermal anti rabies vaccine has been implemented with updated Thai Red Cross regimen which consists of vaccine on 0, 3, 7 and 28 days.[1,3,10] Poor compliance of vaccine leads to mortality due to rabies disease.[10] Every year September 28 marks the anniversary of Louis Pasteur's death, the French chemist and microbiologist, who developed the first rabies vaccine. The theme for this year World Rabies Day 2021 was "Rabies: Facts, not Fear". It was focused on debugging the myths related to Rabies, the importance of dog vaccination and post-exposure prophylaxis, and the need for a united effort toward achieving the elimination of this disease.[11] It is therefore we have focus to understand the pattern of animal bite and their post exposure management after animal bite in the tribal district of Baripada so that the appropriate preventive and control measures can be planned.

METHODS

Study design, location and duration

It was a descriptive cross sectional conducted at Pandit Raghunath Murmu (PRM) medical college and hospital, Baripada, Odisha in anti-rabies vvaccination (ARV) OPD. The clinic has all the facilities for treating an animal bite victim. ARVs and rabies immunoglobulins (RIGs) were available in clinic. The ARV OPD caters to all animal bite victims as this is the only medical college which is attach to district hospital and which is functional on all working days. The study period was conducted from March 2021 to September 2021.

Study population and sampling technique

All animal bite victims attending the ARV clinic for management during the study duration. The inclusion criteria of study population was all animal bite cases belonging to category II and III exposure assessed as carrying a risk of developing rabies& requiring PEP. The exclusion criteria were category I animal bite cases and those who were unwilling to participate. Consecutive sampling technique was applied for the study. All animal bite cases reporting to the ARV clinic were enrolled in the study during the study period.

Study procedure

The data was collected at the ARV OPD, all animal bite participants were included in the study based on inclusion criteria. They were interviewed by using a semi-structured, predesigned and pre-tested schedule. Participants were asked about their socio-demographic profile, type of animal bite, site of bite, first aid management and source of information about management of animal bite. The purpose of the study was explained while using written informed consent from the participants.

Data analysis

The data was entered in Microsoft offices excel and analysis was done by appropriate statistical tool using SPSS version 22.

RESULTS

Total 804 participants of animal bite were included in this study. Among the total participants males constituted 62.3%. 67.4% of the participants were illiterate.

Table 1: Socio-demographic profile information of study population (N=804).

Parameters	N (%)
Age	
0-14	224 (27.9)
15-24	277 (34.5)
25-64	276 (34.3)
>64	27 (3.4)
Sex	
Male	501 (62.3)
Female	303 (37.7)
Education	
Illiterate	542 (67.4)
Literate	262(32.6)
Occupation	
Homemaker	165 (20.6)
Employed	372 (46.3)
Students (children <5 yrs)	267 (33.1)
Socioeconomic status (Based on modified B G Prasad scale)	
Upper/upper middle class	101 (12.5)
Middle class	313 (38.9)
Lower/lower Middle class	390 (48.6)

Total 54.9% of the participants got bitten by dog out of which the most common site of bite was lower limb (53.6%) followed by upper limb (38.7%). According to recent WHO Categories of contact and recommended post

exposure prophylaxis (PEP) of animal bite majority 89.4% of victims belong to category II. The most common irritant used among participants (N=173) who had either cleaned the wound with only water/ not cleaned the wound at all was turmeric (73.41%).

Table 2: Parameters of animal bite of study participants (n=804).

Parameters	N (%)
Type of animals	
Dog	441 (54.9)
Cat	321 (39.9)
Monkey	28 (3.5)
Others	14 (1.7)
Detail of animal habitat	
Pet	238 (29.6)
Immunized	98 (41.0)
Not Immunized	141 (59.0)
Stray / Wild	566 (70.4)
Site of animal bite	
Head & Neck	35 (4.4)
Trunk	7 (0.9)
Back	7 (0.9)
Upper limb	311 (38.7)
Lower limb	431 (53.6)
Others	13 (1.6)
Nature of animal bite	
Single (Superficial)	691 (85.9)
Multiple (Deep)	113 (14.1)

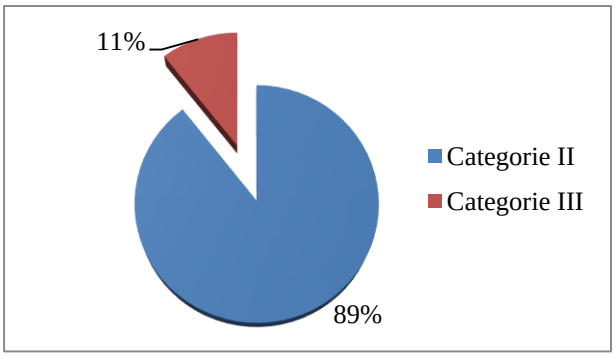

Figure 1: Distribution of animal bite victims based on WHO categories.

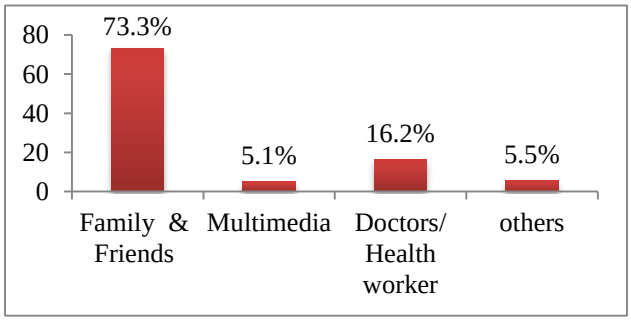

Figure 2: Distribution based on source of information about management of animal bite.

Table 3: Distribution of animal bite victim based on immediate care taken of wound (n=804).

Immediate care	Literate N (%)	Illiterate N (%)	Total
Clean with water and soap	200 (24.87)	428 (53.23)	628
Clean with water only	60 (7.46)	89 (11.07)	149
Wound not washed	2 (0.25)	25 (3.11)	27
Total	262	542	804

p=0.4

Table 4: Distribution of study participants on the basis of substance used as local applicant over wound (n=173).

Type of irritant	N (%)
Turmeric	127 (73.41)
Lime	12 (6.94)
Plant Juice (Jack fruit Gum)	11 (6.36)
Other (Ash, Chili powder, mud etc.)	23 (13.29)
Total	173 (100)

Almost 76.33% (N=200) of the educated participants had cleaned the wound site using water & soap although this result was not significant (p=0.4). In this study we had observed that the reporting to government health centre within 24 hours of bite was found in 67.2% of the participants.73.3% of the participants had acquired their knowledge about management of animal bite from friends & family. In this study we had found that the site of bite, type of bite and type of animals are significantly associated with the age of study participants (p=0.00).

DISCUSSION

The present study was conducted among the animal bite victims attending in ARV OPD in the Government hospital of the Mayurbhunj district PRM medical college & hospital, Baripada. Total 804 animal bite victims are enrolled during the study period. In our study, 68.8% of animal bites belongs to age group 15-64 years and 62.3% were male. 79.4% of the participants in our study who were either students or employed had to suffer from animal bite&this finding is almost similar to the study finding conducted in Surat City where due to their occupation 62.1% were animal bite victims.[12] 54.9% of the victims in our study was bitten by dogs whereas in a study conducted by Pattanayak et al in 2017,76.66% of the participants were bitten by dog.[4] Majority of animals in our study (70.4%) were stray and wild animals which is almost similar to a study conducted by Umarigar et al in 2012 where 94% of cases were bitten by stray dogs but in a study conducted by Singh et al in 2020, bites by pet animals (47%) are more common than those by stray animals (35.9%), followed by wild animals (12.8%).[12,13] We have found the most common site of animal bite was lower limb (53.6%) which is almost same like the study conducted by Sangeetha et al in 2016,where also the majority had animal bites were on leg (60.87%).[9]

Table 5: Association of animal bite parameters with age among the study participants.

Parameters	Age (years)								P value
	0-14		15-24		25=64		> 64		
	N	%	N	%	N	%	N	%	
Site of bite									
Head & Neck	21	9.4	0	0.0	14	5.1	0	0.0	
Trunk	0	0.0	7	2.5	0	0.0	0	0.0	
Back	0	0.0	7	2.5	0	0.0	0	0.0	0.000
Upper limb	88	39.3	105	37.9	104	37.7	14	51.9	
Lower limb	108	48.2	152	54.9	158	57.2	13	48.1	
Others	7	3.1	6	2.2	0	0.0	0	0.0	
Type of animal									
Dog	143	63.8	134	48.4	150	54.3	14	51.9	
Cat	67	29.9	122	44.0	119	43.1	13	48.1	0.000
Monkey	7	3.1	21	7.6	0	0.0	0	0.0	
Others	7	3.1	0	0.0	7	2.5	0	0.0	
Type of bite									
Single	178	79.5	257	92.8	235	85.1	21	77.8	0.000
Multiple	46	20.5	20	7.2	41	14.9	6	22.2	

The lower limb is the most common area in our study may be because in tribal area majority of male people wear lungi, gamcha or dhoti.[9] In our study we had found the majority of animal bite cases were category II (89.4%) followed by category III (10.6%) whereas in a study conducted by Ain in 2018,78% were category III bites & also a study conducted by Venkatesan et al in 2016, conducted among children, where it was found that 67% of wounds belonged to class III wounds.[14,15]

Limitations

Limitation of current study was the study cannot be extrapolated to the whole population as it was based mainly on a tribal area.

CONCLUSION

The present study was undertaken to understand the sociodemographic profile, the pattern of animal bite and the health seeking behavior among the tribal population in and around Baripada of Mayurbhunj district. Majority of people specially, in rural and tribal area were illiterate and they don't have any knowledge about animal bite or it's management. This study had found that those who are literate had done a proper wound management before coming to ARV clinic. So, literacy proved to have a major impact on wound management.

Recommendations

Many rabies cases can be seen today even though Rabies is fully preventable due to lack of awareness& knowledge. Behavior changes communication (BCC) along with health education to create awareness is a vital weapon for controlling rabies especially in developing country like India. The vaccination of all pets should be made compulsory for all pet owners and control of stray dogs should be done by government under NRCP with co-ordination from the NGOs who are involved in rabies prevention activities. This study may help the National rabies control programme officer for strengthen their services and creating awareness about rabies and its management among tribal lower socio-economic population.

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