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Research Article

Epidemiological study of animal bite victims in Central India: a cross sectional institutional study

Neera Marathe*, Sanjeev Kumar

Department of Community Medicine, Shyam Shah Medical College, Rewa, Madhya Pradesh, India

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***Correspondence:**
Dr. Neera Marathe,
E-mail: neera13@rediffmail.com

ABSTRACT

Background: Rabies, an invariably fatal viral disease, is transmitted to humans through animal bites, mostly dogs. Of the estimated 25,000 deaths due to rabies in SEAR, a majority are in India and Bangladesh. Objective of the study was to study the epidemiological trend of animal bite by in central India.
Methods: A cross sectional institutional study was conducted in 406 animal bite victims presenting to the tertiary care hospital and district hospital Rewa, Madhya Pradesh, India. Information collected with the pre tested structured questionnaire after obtaining informed verbal consent. Data pertaining to the socio demographic profile of victim, category of bite, provoked/ unprovoked time and place of bite, characteristic of animal was collected. Data was analysed using graph pad software.
Results: Among 406 victims 76.3% were males, 56.7% belongs to 15-45 yrs, 61.6% were living in urban area, 31.3% and 21.7% of the victims were agriculture worker and laborers respectively. 95.8% victims bitten by dog of them 89% were stray, 89.4% had Category III bite, lower extremity was affected in 60.8%, 75.9% bites were unprovoked, fate of the animal was not known in 78.6% and 46% of the victims were affected during evening hours.
Conclusions: Animal bites, especially dog bites still poses public health problem. Majority of the bites are attributed to stray dogs, unprovoked and category III bites. This indicates need of large amount of antirabies serum or HRIG thereby increasing the cost of management of animal bite cases. There is a need to control stray dog population and immunize pet dogs.

Keywords: Animal bite, Dog bite, Rabies, India, Epidemiology

INTRODUCTION

Rabies, an invariably fatal viral disease, is transmitted to humans through animal bites, most commonly dogs. Dog bites are the primary source of human infection in all rabies endemic countries and account for 96 % of rabies cases in South East Asia region.

According to WHO, Each year, 23 000 – 25 000 people die in the SEA Region due to rabies. These accounts for approximately 45% human deaths due to rabies worldwide.[1] Of the estimated 25,000 deaths due to rabies in SEAR, a majority are in India (around 19,000) and Bangladesh (2000). More than 2.5 million people undergo post-exposure prophylaxis after being bitten by rabid or suspected rabid animals causing considerable morbidity and economic loss.[2] In spite of economic loss and sufferings, there is little information about the incidence of animal bites and rabies because of a lack of systematic reporting In India. As rabies is not a notifiable disease in India it is widely believed that this figure may be an underestimate.[3] Sporadic studies have been conducted indifferent parts of India but profile of bites not only varies from country to country but region to

region within country.[4,5] Although rabies is potentially preventable disease due to availability of effective preventive and control measures lack of epidemiological data poses threat to its effective implementation. The success of any elimination programme depends on accurate assessment of the burden of disease, morbidity and mortality and an understanding of the epidemiological trends. These require a strong epidemiological surveillance mechanism. Unfortunately dog and human rabies are not notifiable diseases in most endemic countries.[6] Therefore the researchers aimed to study the epidemiological trends and characteristics of people bitten by animals in Rewa city in order to plan for prevention and enhance management strategies.

METHODS

The present cross-sectional study was undertaken among animal bite victims attending GMH, SGMH associated with medical college and District Hospital Bicchhia of Rewa city from February 2014 to February 2015.

Sample size estimation

Data collection was done for 406 subjects. The sample size was estimated by taking the average of previous 3 years of animal bite victims attending GMH, SGMH and District hospital, Bicchhia. 10% of the victims fulfil the study purpose hence sample size was determined to be 406 study subjects.

Inclusion criteria

Animal bite victims presenting to the health care facility for seeking treatment and gave consent for participation.

Exclusion criteria

Those who did not give consent, critically injured and not able to respond were excluded.

Ethical clearance

The study is commenced after approval from institutional ethical committee. Invasive procedure and active interventions was not done in the study so only informed verbal consent was taken. They were assured that their responses would be kept anonymous and confidentiality maintained.

Data collection method

These health care centres were visited by the interviewer for 2 days in a week for the purpose of data collection. All the cases of animal bite victims visiting at these centres on particular day were contacted and explained about the study purpose. In case of victim <15 years attendees preferably mother or father were explained about study and information collected thereafter. A pretested and structured oral questionnaire was used to elicit the required information pertaining to the epidemiology of animal bite. Face to face interview of victims and local examination was done after taking informed verbal consent.

Study variables

Age, sex, residence, occupation of the victim. Information about animal included stray/ pet/ wild animal biting, provoked/unprovoked bite, site of bite, fate of the animal, category of exposure, time of bite, and locality of bite.

Categorization of exposures was done as per guidelines given by World Health Organization (WHO).[7]

Provoked/unprovoked bite

Bite resulted from subject initiating interaction with the pet animal such as playing with the dog or annoying the dog during his meal was considered as provoked. Data management and statistical analysis: Data was analysed using graph pad software. Results were presented in percentages and proportion.

RESULTS

Table 1: Sociodemographic information of animal bite victims (n=406).

Sociodemographic characteristics	Frequency/ Number	%
Gender		
Male	310	76.3
Female	96	23.7
Residence		
Urban	250	61.6
Rural	156	38.4
Age(in years)		
0-5	17	4.2
6-<15	55	13.5
15-45	226	56.7
>45	108	26.6
Occupation		
Student	74	18.2
Unemployed and housewife	42	10.3
Service and business	75	18.5
Agriculture work	127	31.3
Laborer	88	21.7

Total 406 victims of animal bite were included in the study. Males constituted 310 (76.3%), whereas, females were 96 (23.7%) of the total victims. Majority 226 (56.7%) were observed in the age group of 15-45 years. 61.6% victims presenting to hospital were residing in urban area. Regarding occupation 31.3% and 21.7% of the victims were agriculture worker and labourers respectively (Table 1).

Table 2: Distribution of study subjects according to age group and site of bite.

Age group (n)	Head& neck	lower extremity	Upper extremity	Abdomen back multiple sites
0-5 (17)	12	02	01	02
6-<15 (55)	10	26	13	06
15-45 (226)	7	148	50	21
>45 (108)	6	71	21	10
Total	35 (8.6%)	247 (60.8%)	85 (21%)	39 (9.6%)

Lower extremity & genitals 247(60.8%) were most commonly affected site followed by upper extremity, fingers, hand and wrist 85(21%). Lower extremity was the most common site affected in 15-45 year age group while 0-5 year age group subjects had bite on head & neck most commonly (Table 2).

Table 3: Type of animals (n=406).

Animal	Number	Percentage
Dog	389	95.8
Stray	361	88.9
Pet	28	6.9
Cat	06	1.5
Monkey	03	0.8
Cow	06	1.5
Pig	01	0.2
Horse	01	0.2
Bear, Jackal, Leopard	00	0

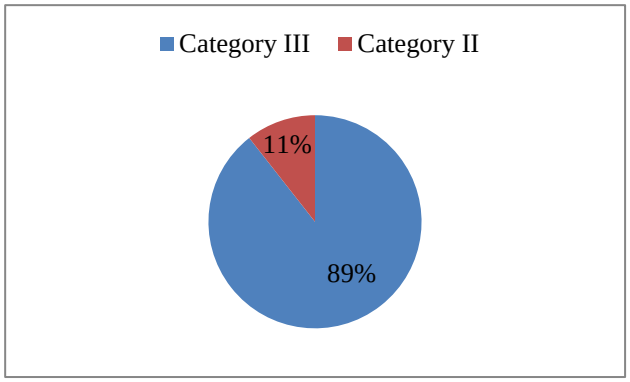

Figure 1: Category of bite (n=406).

Dog bite 389 (95.8%) was the most common animal bite reported and were mostly stray (Table 3). Most of the victims 363 (89.4%) were of category III, there were 43 (10.6%) victims of category II but no victims has been reported in category I (Figure 1). Most of the victims 187(46%) were bitten during evening hours followed by 153 (37.7%) during morning hours. Unprovoked bites were seen in majority of the victims 308 (75.9%) whereas provoked bites were seen in only 98 (24.1%) victims. Most of the victims 319 (78.6%) were Not able to observe the biting animal. 19.9% victims told that biting animal was alive till the time of seeking treatment while 06 animals were dead or killed by people and 209 victims (51.5%) were bitten in market/street area followed by field/farms/construction areas (37.6%). 8.4% of victims had previous history of animal bite in last 5 years (Table 4).

Table 4: Profile of animal bite (n=406).

Characteristics of Bite	Frequency	Percentage
Time of bite		
Morning	153	37.7%
Noon	20	4.9%
Evening	187	46.0%
Night	46	11.4%
Type of bite		
Provoked	98	24.1
Unprovoked	308	75.9
Fate of animal bite		
Alive	81	19.9
Killed/died	6	1.5
Not able to observe/Escaped/Fate not known	319	78.6
Place of animal bite		
Own residence	70	7.2
Neighbor's house	15	3.7
Market/ street	209	51.5
Field/farms/construction areas	112	37.6
Previous history of animal bite		
Yes	34	8.4
No	372	91.6

DISCUSSION

The present study revealed that animal bite was more common among males and male to female ratio was found to be 3.2:1. This finding was quite similar to the other studies.[5,8-10] This may be due to the fact that men were more likely to go out of their homes for work as compared to female s in this area. Our study shows more proportion of animal bite victims from urban areas this is different from the other studies which show preponderance from rural areas.[11-13] This may be due to the peripheral location of health centres in other studies. They cater population predominantly from rural areas. Increasing awareness among urban people for seeking advice may be the factor responsible for more urban presentation. Most of the victims belong to age group 15-45 yrs. This is the productive age group usually go

outside for job and to earn livelihood. Other studies show the similar findings.[8,9,13-15] However some studies depicts children are quite vulnerable for animal bite.[5,16] Our study found that most of the victims were agriculture workers and labourers by occupation. Housewife and unemployed were at least risk for animal bite. This correlates well with the time spend in outdoor activities and risk for animal bite. Study done by Umrigar et al shows correlation of occupation requiring travel with risk for animal bite.[9] Wankhede et al also reported that persons having field job to earn livelihood were vulnerable for animal bite.[11] Similar findings were reported by Kakrani et al.[17] The most common site of bite was lower limb and majority of victims were having category III bite as per WHO classification. This is similar to the other studies.[4,8,10,13,16,18] In the younger age group most common site involved was head, neck and upper extremity. Similar findings were shown by Singh et al.[14] Children were prone to have bite on head, neck and upper extremities due to the short stature. Our study showed that majority 389 (95.8%) were victims of dog bites and most of the victims 361 (89%) were bitten by stray dogs. The finding is similar to the other studies.[5,9,13,16,19,20] Most of the bites have taken place in evening hours and morning hours with proportion slightly higher in evening hours. Wankhede et al and Khokhar et al reported majority of bites occurring in morning hours.[11,16] Umrigar et al, in his study reported that the morning hours was the most common time of bite.[9] Venu shah et al in her study reported 38.8% of bites between 4 and 8 pm.[10] only small proportion of cases (8.4%) had previous history of animal bite. This is in contrast with the study done by Subita Patil in which 28.6% cases had recurrent history of dog bite. Study done by Khokhar et al described Previous history of dog bite was present in 77 (24.60%) subjects.[8,16] Almost three- fourth victims had unprovoked bite in our study. Study done by Khokhar found at Alipur the unprovoked bites were 74.76%. The study conducted at Juniad M et al has found unprovoked bites in 80.6% of cases.[21] In our study majority of the study subjects were affected by animal in the market followed by farms and construction site. In study done by Wankhede V majority of dog-bites, (71.9%) have taken place while walking on road.[21] Rumana R et al reported that 35.2% victims bitten where they going to market place & 28.9% victims bitten when they going to field.[22]

CONCLUSION

Animal bites, especially dog bites still poses public health problem in urban area of our country. These bites not only cause increase morbidity and mortality but also loss of workers days and cost for treatment. People at risk were mainly men and 15-45 yrs age group. The majority of the bite victims had occupation involving outdoor activity. Majority of the bites are attributed to stray dogs and are unprovoked, occurred during evening and morning hours that is dark hours Maximum no. of cases belonged to Category III bites. This indicates the importance of need of large amount of quality antirabies serum or HRIG thereby increasing the cost of management of animal bite cases. There is a need to control stray dog population and immunize pet dogs. On the other hand there is a need to implement Public health educational program to create awareness in the public regarding the dangers of animal bite and to avoid contact with the stray dogs. Active surveillance activities must be carried out to know the actual burden of animal bite problem.

Limitations

Since the subjects included in the study were patients attending tertiary care centre and district hospital study findings cannot be generalized to the whole population at large. To get more insight for assessing burden and epidemiology of the animal bite, community based studies are needed.

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