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Original Research Article

Profile of animal bite cases at immune prophylaxis clinic, tertiary care centre

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ABSTRACT

Background: Animal bite, one of the common causes of physical injuries in spite of a long standing nature of the dog bite problem and the presence of effective intervention strategies for rabies control, it continues to pose a major public health challenge to program planners. So the present study is conducted to study Profile of animal-bite cases at immuno-prophylaxis clinic, at tertiary care centre.
Methods: The present study was an observational cross-sectional study carried out at immune prophylaxis clinic of tertiary care centre, from 1st January 2013 to 31st December, 2013. All the registered cases of animal bite attending immune-prophylaxis clinic, which are ready to participate in the study were included as study population. The method used was systematic random sampling. First case was selected randomly using lottery method and then every fifth case reporting to immune prophylaxis clinic was taken in the study group. Total 3504 cases of animal bite were reported during the study period. 20% of these i.e. 700 cases of animal bite were included in the study.
Results: Out of 700 study subjects, highest number of bites occurred in the age group 21-30 years i.e. 155 (22.1%). Maximum study subjects 471 (67.3%) were from urban area and 53% of bites occurred during daytime. Maximum cases were the class-III bite i.e. 600 (85.7%).
Conclusions: Maximum number of bites seen among 21-30 years of age group predominantly seen among male study subjects. 49.6% study subjects were bitten by pet animals and 47.6% were bitten by stray animals. Dog was the principle animal responsible for the bite of study subjects. 85.7% of study subjects were of class III bite among them 75% study subjects had reported to hospitals within 24 hours. Severe the degree of exposure, earlier was reporting to the hospital was statistically significant.

Keywords: Class-III bite, Dog bite, Immune prophylaxis clinic

INTRODUCTION

Animal bite, one of the common causes of physical injuries, is defined as bite or claw wound from an animal which is responsible for large number of morbidities and mortalities in humans, most importantly, highly fatal viral infection-rabies.[1]

In spite of a long standing nature of the problem and the presence of effective intervention strategies for rabies control, it continues to pose a major public health challenge to program planners. Prevention of rabies in humans depends on a combination of interventions. These include provision of post-exposure prophylaxis (PEP) to exposed patients, pre-exposure immunization of people at high risk exposure, control of infection in animal reservoirs and control of dog population. To formulate the Rabies control strategies, it is important to know about the epidemiology of dog bite and the post exposure practices.[2]

Aims and objectives

To study the profile of animal-bite cases at immuno-prophylaxis clinic, tertiary care centre.

METHODS

The present study was an observational cross-sectional study carried out at immune prophylaxis clinic of Tertiary Care Centre at Government medical college, Aurangabad from 1st January 2013 to 31st December, 2013. All the registered cases of animal bite attending immune-prophylaxis clinic, which are ready to participate in the study were included as study population. The method used was systematic random sampling. First case was selected randomly using lottery method and then every fifth case reporting to immune-prophylaxis clinic was taken in the study group. Total 3504 cases of animal bite were reported during the study period. 20% of these i.e. 700 cases of animal bite were included in the study. Detail history of each study subject was taken in a pre-designed, pre-tested, semi-open (annexure-I) proforma and investigator himself carried out clinical examination on the 1st day of visit. All those persons who rejected to participate were excluded. The history was narrated by patient. In case of children, history was narrated by a person accompanying them. Every study subject of post exposure prophylaxis was followed up to the period of completion of anti-rabies treatment. Some patients who still didn't report back were followed telephonically for the vaccination history. The WHO recommended schedule was followed for cell-culture and embryonated egg-based vaccine (CCEEV) immunization. Finally, the data collected was analyzed using Microsoft Excel 2007 software, EPI info version 3.4.3, and SPSS 19 version

RESULTS

Total 700 cases of animal bite were studied. Follow up of every study subject of post exposure prophylaxis was done up to the completion of prescribed course of treatment.

Table 1 shows highest number of bites occurred in age group 21 to 30 years i.e. 155 (22.1%), followed by age group 0 to 10 years i.e. 149 (21.3%). Lowest number of bite occurred in age group >60 years i.e. 33 (4.7%). Other groups included 112 (16.0%) of cases in 11 to 20 years age group, followed by 111 (15.9%) in 31 to 40 years, 81 (11.6%) in 41 to 50 years and 59 (8.4%) in 51 to 60 years age group. Nearly 60% of the cases were between 0 to 30 years of age. Out of 700 study subjects, 482 (68.9%) were males and 218 (31.1%) were females.

Table 1: Distribution of study subjects according to age and sex.

Sr. No.	Age group (years)	Male	Female	Combined
1	0 to 10	93 (13.3)	56 (8.0)	149 (21.3)
2	11 to 20	84 (12.0)	28 (4.0)	112 (16.0)
3	21 to 30	125 (17.9)	30 (4.3)	155 (21.1)
4	31 to 40	65 (9.3)	46 (6.6)	111 (15.9)
5	41 to 50	50 (7.1)	31 (4.4)	81 (11.6)
6	51 to 60	46 (6.6)	13 (1.9)	59 (8.4)
7	> 60	19 (2.7)	14 (2.0)	33 (4.7)
Total		482 (68.9)	218 (31.1)	700 (100)

Figures in parentheses indicate percentage, X^2_6 =26.548, p<0.001.

Table 2: Distribution of study subjects as per the status of animal.

Sr. No.	Animal	Status of animal			Total
		Pet	**Stray**	**Wild**	
1	Dog	322 (46.0)	324 (46.3)	-	646 (92.3)
2	Cat	22 (3.1)	5 (0.7)	-	27 (3.8)
3	Others	3 (0.4)	4 (0.6)	20 (2.9)	27 (4.0)
Total		347 (49.4)	333 (47.6)	20 (2.9)	700 (100)

Figures in parentheses indicate percentage.

Table 3: Distribution of Study subjects according to time of bite.

Sr. No.	Time of animal bite	Residence		Total
		Rural	**Urban**	
1	6 am to 12 noon	58 (8.3)	166 (23.7)	224 (32.0)
2	12 noon to 6 pm	51 (7.3)	96 (13.7)	147 (21.0)
3	6 pm to 12 midnight	91 (13.0)	165 (23.6)	256 (36.6)
4	12 midnight to 6 am	29 (4.1)	44 (6.3)	73 (10.4)
Total		229 (32.7)	471 (67.3)	700 (100)

Figures in parentheses indicate percentage.

Table 4: Distribution of study subjects as per the class of animal bite.

Sr. No.	Class of bite	Residential status		Total
		Rural	Urban	
1	Class-I	2 (0.3)	3 (0.4)	5 (0.7)
2	Class-II	22 (3.1)	73 (10.4)	95 (13.6)
3	Class-III	205 (29.3)	395 (56.4)	600 (85.7)
Total		229 (32.7)	471 (67.3)	700 (100)

Figures in parentheses indicate percentage.

These findings reflect that 'adults between 21-30 years and children below 10 years' are the most vulnerable age groups for animal bite. This may be due to fact that adults in this age group have to go outside for work or job and fall victim to animal bite. Children below 10 years of age are naughty and vivacious, inviting the animal bite.

Table 2 shows the distribution of study subjects as per the status of animal. Out of 700 study subjects, 347 (49.6%) cases were bitten by pet animals and 333 (47.6%) cases were bitten by stray animals. There were 20 (2.9%) cases of wild animal bite. Out of these 17 (2.4%) were bitten by monkey, 2 (0.3%) by wolf and 1 (0.1%) case was by mongoose.

Table 3 shows distribution of study subjects according to time of bite. It is evident from above table that, frequency of bite was more in daytime 53% as compared to night 47%. There was no association between urban/rural status of the study subjects and time of bite (χ^2_3 =7.561, p>0.05).

The table no.4 shows the distribution of study subjects according to class of animal bite. Out of 700, maximum number of study subjects were of class-III bite i.e. 600 (85.7%) followed by class-II bite i.e. 95 (13.6%). There were only 5 (0.7%) study subjects in class-I bite.

DISCUSSION

In present study it was found that highest number of bites occurred in age group 21 to 30 years i.e. 155 (22.1%), followed by age group 0 to 10 years i.e. 149 (21.3%). Lowest number of bite occurred in age group >60 years i.e. 33 (4.7%). Other groups included 112 (16.0%) of cases in 11 to 20 years age group, followed by 111 (15.9%) in 31 to 40 years, 81 (11.6%) in 41 to 50 years and 59 (8.4%) in 51 to 60 years age group. Nearly 60% of the cases were between 0 to 30 years of age. Out of 700 study subjects, 482 (68.9%) were males and 218 (31.1%) were females. These findings reflect that 'Adults between 21-30 years and children below 10 years' are the most vulnerable age groups for animal bite. This may be due to fact that adults in this age group have to go outside for work or job and fall victim to animal bite. Children below 10 years of age are naughty and vivacious, inviting the animal bite.

Some authors observed similar findings in their study. Eslamifar et al, reported that bites were most frequent among the 20-29 years age group (30.1%).[3] Masoodi et al reported 29.61% of cases below 10 years of age and Venu Shah et al reported 48.4% of cases below 25 years of age.[4,5] However, According to Wankhede et al, 30.2% cases belonged to 26-45 years age group.[2] Pradeep et at and Varsharani et al observed that about 44 to 57% of cases belonged to 15-45 years age group.[1,6] Among all the animal bite cases percentage of bite was more in male considering all age groups as compared to female. This difference in both sexes in all age group was statistically significant (χ^2_6 =26.548, p<0.001). In present study 4.7% study subjects were above 60 years of age. Thus this age group is least prone to animal bite. Wankhede et al reported 9.7% cases above 60 years of age, while according to Umarigar et al the contribution of elderly above 60 years was 3.9%.[1,2] Elderly people above 60 years of age remain mostly indoors and even, if they go out, they are not alone most of the time. Thus they are less exposed to risk of animal bite.

In present study there were 471 (67.3%) study subjects from urban area while 229 (32.7%) were from rural area. Out of 700 study subjects, 482 (68.9%) of study subjects were male and 218 (31.1%) were female, male to female ratio being 2.21:1. Out of 482 males, 332 (68.9%) belonged to urban and 150 (31.1) belonged to rural area. Out of 218 females, 139 (63.8%) belonged to urban and 79 (36.2%) belonged to rural area. Urban/Rural difference was not statistically significant (χ^2_1=1.786, p>0.05). The male preponderance was similar to the observation of many other authors, in their study. These are; Sharma et al and Kendre et al observed that 62 to 64% of the animal bite cases were male and 36 to 38% were female.[6,7] Eslamifar et al, Rambhau et al, Shah et al, Umarigar et al, Wankhede et al observed that about 76 to 83% of the patients studied were male.[3,5,8,9] In present study, 32.7% study subjects were from rural area while 67.3% were from urban area. Similar finding is seen by Kendre et al.[6] They observed that 64.57% of animal bite cases were from urban area and 35.43% were from rural area. However, Masoodi et al, Rambhau et al, Wankhede et al observed that about 58% to 62% of animal bite cases were from rural areas.[2,4,8]

In present study it was observed that, the frequency of bite was more in daytime (53%) as compared to night (47%). There was no association between urban/rural

status of the study subjects and the time of bite (χ^2_3 =7.561, p>0.05). Many authors observed similar findings in their study. Sanjay et al studied "clinico-epidemiological study of class-iii animal bite cases and rabies immunoglobulins" at Kompegowda Institute of Medical Sciences, Bangalore.[10] They reported that 76.3% were bitten by daytime. Shah et al and Umarigar et al reported that about 29 to 39% of bites occurred between 4 and 8 pm in the evening.[1,5] Umarigar et al reported that majority (37.4%) of the bites occur between 4 and 11 am in the morning.[9] Wankhede et al observed that majority of the dog bites (82.3%) have taken place at morning time between 6 am to 4 pm.[2] About 5.4% of subjects suffered from dog bite during evening period of 4 pm to 8 pm while 12.3% were bitten in the night between 8 pm to 12 mid-nights. There was no case of dog bite between mid-nights to 6 am. Frequency of bite was more in daytime as compared to night. This seems to be reasonable as people are out of their homes for their routine activities increasing the exposure to animals. Frequency of bite was minimum in late night and early morning (10.4%) as people stay in their home during this period.

In present study, almost half of biting animals were pet i.e. 347 (49.6%) followed by stray 333 (47.6%) and only 20 (2.9%) were wild. Out of total 347 (49.6%) pet animals, maximum 250 (72%) were from urban area while 97 (28%) were from rural area. Among 333 stray animals, 211 (63.4%) were from urban area while 122 (36.6%) were from rural area. Among 20 wild animals there was equal contribution from urban and rural area. Out of 229 rural animal bite cases, 42.3% were due to pet animals, 53.3% due to stray and 4.4% were due to wild animals. Among 471 urban animal bite cases, 53% were due to pet animals, 44.8% due to stray and 2.2%. Thus the proportion of bites due to stray and wild animals was higher among rural study subjects. There was association between category of animals and residential status (χ^2_2 = 8.615, p<0.05). However, Sharma et al reported that 61.64% cases were bitten by pet dogs and remaining 38.36% by stray dogs.[7] Rambhau et al observed that 67.58% of the animal bites were from stray animals, followed by 28.67% from pet and 3.75% from wild animals.[8] According to some others in their study more than 90% of bites were from stray animals. These are Masoodi et al, Shah et al, Umarigar et al, Umarigar et al, Wankhede et al (2013).[1,2,9]

In present study majority of the bites, 664 (92.3%) were due to dog followed by 27 (3.9%) cat, 17 (2.4%) monkey, 4 (0.6%) pig, 2 (0.3%) due to goat and wolf each while only 1 case (0.1%) due to horse and mongoose each. Among all the animal bites, dog bite was common in both urban and rural area. Out of 646 cases of dog bite, 438 (67.8%) had occurred in urban area, while 208 (32.2%) occurred in rural area. However, Eslamifar et al reported that dogs were responsible for 65.9% of animal bites, followed by cats (25.44%), squirrel (3.89%), monkey (1.52) and remaining 3.25% by other animals.[3] Rambhau et al observed that dog was biting animal in 92.8% of the cases, followed by cat (3.4%), monkey (1.4%), pig (1.4%) and other animals in 1.0% cases.[8] Shah et al reported dog as biting animal in 99.7% of cases and cattle in remaining 0.3% cases.[5] Umarigar et al, and Kendre et al observed that 94 to 97% of cases involved dog as biting animal.[6,9] In all above studies percentage of biting animal was varying but dog was the most common biting animal.

In present study, majority of study subjects had suffered from class-III exposure i.e. 600 (85.7%), followed by class-II i.e. 95 (13.6%) and only 5 (0.7%) had class-I exposure. Studies carried out by various authors at different places shown different proportion of class-I, class-II and class-III bites. According to Masoodi et al, Rambhau et al, Shah et al, Wankhede et al, class III was most predominant form of exposure ranging from 60 to 92%.[2,4,5,8] However, Umarigar et al and Kendre et al reported class II as predominant form of exposure.[6,9] The proportion of class I exposure was below 2% in all the above studies except by Masoodi et al who reported it as 9.96%.[4]

In present study it was observed that more than 75% of study subjects had reported to the hospital within 24 hours of exposure, about half of these had reported within 12 hours. From the remaining cases, 43 (6.1%) had reported between 24-48 hours while 109 (15.6%) cases reported after 48 hours of bite. The majority of exposures were of class-III in nature i.e. 470 (67.2%) followed by class-II i.e. 74 (10.6%) and class-I 4 (0.5%). It is evident from the above findings that, severe the degree of exposure, earlier was reporting to the hospital, which was statistically significant (χ^2_3 =13.190, p<0.05). Many other authors revealed similar findings in their studies. Sharma et al observed that 56.3% of cases reported within 12 hours of bite, followed by 15.8% between 18 to 24 hours, 12.4% after 24 hours, 10.4% between 12 to 18 hours and only 5.1% of cases reported within 6 hours of bite.[7] Masoodi et al revealed that 52.94% of dog bite victims reported within 24 hours of bite while 21.68% reported in 2 days, 16.69% reported within 3 days while 8.69% reported after 7 days of animal bite.[4] Gadekar et al revealed that majority of the cases reported between 24 to 48 hours of bite (60.7%), followed by 19.1% between 3 to 4 days and only 13% of cases reported within 24 hours of bite.[8] Remaining 7.2% cases reported after 5 days of exposure. Shah et al observed that 68.5% of cases reported to anti- rabies clinic within 24 hours of bite while 17.5% attended on the 2nd day of bite.[5] Umarigar et al observed that about 74 to 76% of cases reported to health facility within 24 hours of bite.[9] Wankhede et al revealed that majority of the cases reported to ARV clinic within 24 hours of dog bite (88.4%).[2] The other extreme is that one case has reported almost one month after the incident. Kendre et al observed that 43.5% of animal bite cases visited anti-rabies clinic within 24 hours of bite, about 20.18% within 1-2 days, 16.67% within 2-3 days and 3.31% of the cases visited after 4 days of animal bite.[6]

CONCLUSION

Highest number of bites occurred in the age group 21-30 years i.e. 155 (22.1%), followed by age group 0-10 years where they were 149 (21.3%). Lowest number of bites occurred in age group of above 60 years i.e. 33 (4.7%). Out of 700 study subjects, 482 (68.9%) were males and 218 (31.1%) were females. Male to Female ratio was 2.21:1 reflecting the predominance of male victims of animal bites. 471 (67.3%) study subjects were from urban area and 229 (32.7%) were from rural area. 332 (47.4%) study subjects were urban males while 79 (11.3%) were urban females. Frequency of bite was more in daytime (53%) as compared to night (47%). Frequency of bite was minimum in late night and early morning (10.4%). There was no association between Urban / Rural status and time of bite. Urban numbers of study subjects were more than rural. 347 (49.6%) study subjects were bitten by pet animals and 333 (47.6%) study subjects were bitten by stray animals. Also there were 20 (2.9%) wild animals responsible for bite. There was association between the category of animal and residential status. Naturally, stray and wild bites are more in rural area as compared to urban. This also highlights the importance of pet animals as major source of bite. Dog was the principal animal responsible for the bite study subjects. Dog bites were common in both urban and rural area. Maximum numbers of study subjects were of class-III bite i.e. 600 (85.7%) followed by class-II i.e. 95 (13.6%). There were only 5 (0.7%) study subjects in class-I bite. More than 75% of study subjects had reported to hospital within 24 hours, out of which 39% reported to hospital within 12 hours of bite. 15.9% of study subjects reported after more than 48 hours of exposure. Severe the degree of exposure, earlier was reporting to the hospital was statistically significant. Health education must include importance of reporting of animal bite cases within 12 hours to health care centre. Study finding shows that, 49.6% study subjects were bitten by pet animals so adequate vaccination is required for prevention of rabies.

Recommendations

Health education campaign is necessary for general public regarding the importance of care of dogs, early reporting of less severe animal bite cases to the hospital and prevention of rabies. Mother's health education about consequences of animal bite and protection of children especially children under five years of age is important during mother craft heath education. Registration, licensing and vaccination of domestic animals should be made obligatory for prevention of Rabies

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