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Epidemiology of Animal Bite Cases Attending Tertiary Health Care Centre of Bhuj City of India: A Cross-Sectional Study

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Abstract

Animal bite, especially dog bite is significant public health problem in urban India. Socio-cultural practices, myths and beliefs are considered as major problem for post-exposure prophylaxis of animal bites.The aim of this study was to explore epidemiological factors associated with animal bites including dog bite cases reporting at Tertiary Health Care Centre of Bhuj city. It was a cross-sectional study conducted among new cases of animal bites registered at Tertiary Care Centres of Bhuj city. It was found that out of total 119 cases of animal bites majority (49.6%) belonged to 15-45 years of age-group and 70 % were male. Stray dogs were involved in 86% animal bite cases. Half(50.4%) of bites were unprovoked. Category III bites were seen in 76(64 %) of cases. In 81.5% cases lower extremities were affected. Majority 109(94.7%) of cases had received first dose of ARV within 24 hours. Only 63.9% cases had history of wound cleaning at home. It was concluded that local wound treatment immediate after an animal bite is an important basic step in the management of any animal bite case and this was lacking in most of the subjects. Efforts to eliminate the stray dogs are required.

Keywords: Animal bites, rabies, epidemiological, tertiary health care centre, Bhuj

Introduction

The claw wound or animal bite is significant cause of large number of human morbidities and mortalities which includes rabies. [1] About 96% of animal bite cases in urban areas are dog bite. Rabies virus are transmitted through saliva from animal to human beings or animal to other animal by means of bites, scratches, licks on broken skin and mucous membrane.[2] Nearly 99 % of all human rabies victims attributed to canine rabies which is continues to terrify 87 countries or territories of the world.[3]More than 99% of all human rabies deaths occur in the developing world[4] and reliable data regarding rabies is not available due to lack of organized surveillance system.[5]According to WHO report, human deaths from endemic canine rabies were estimated 55000 deaths in a year, worldwide [6] from which 56% contribution from South East Asia Region.[7]In India, dogs are responsible for about 97% of human rabies, followed by cats (2%), jackals, mongoose and others (1%). The disease is mainlytransmitted by the bite of a rabid dog.[8]In India, every year 20,000 deaths and 17.4 million animal bite cases were reported.[7] Rabies is reported throughout the year from all states of India except Lakshadweep and the Andaman & Nicobar Islands.[9]Due to presence of multiple religious & socio-cultural practices & beliefs associated with rabies, economic and political factors and lack of accurate data; the disease has not been brought under control, even though available control measures are both economic and effective, [2,5]

This study was carried out with the objectives of to explore epidemiological factors associated with animal bites including dog bite cases reporting at Tertiary Health Care Centreof Bhuj city.

Material and Methods

The present cross-sectional study was conducted at GK General Hospital, Bhuj (Gujarat) over a period of three months, January-March 2014 by the Department of Community Medicine. All new cases of animal bite visiting at hospital during the study period were included in the study. Personnel interview of patient and clinical examination was done for each case after taking verbal informed consent. A pre tested semi structured questionnaire was used to record data pertaining to the epidemiology of animal bite. The collected data were analyzed using Epi info software.Categorization of exposures was done as per guidelines given by World Health Organization (WHO)[10]. Bite was considered as provoked resulted from subject initiating interaction with the dog such as playing with the dog or annoying the dog during his meal.

Results

Total 119 cases were reported during the study period. Male constituted 83 (70%) cases and female constituted 36 (30%) cases.Majority of the cases 59 (49.6%) were in the age group of 15-45 years.

Table 1: Distribution of cases according to age-group and gender (n=119)

Age-group (in years)	Male (%)	Female (%)	Total (%)
0 to 5	3(2.5)	1(0.9)	4 (3.4)
6 to 14	15(12.6)	3(2.5)	18(15.1)
15 to 45	40(33.7)	19(15.9)	59(49.6)
46 to 60	17(14.3)	11(9.2)	28(23.5)
> 60	8(6.7)	2(1.7)	10(8.4)
Total	83(69.8)	36(30.2)	119(100)

In 118(99.16%) cases the animal involved was dog. Bites were unprovoked in 60(50.4%) cases. In majority, 113 (94.96%) of cases bites occurred within city.A total of 102 (85.7%) cases of animal bites were attributed to stray animals, 14(11.8%) cases were attributed to pet animals and 2(1.7%) cases were attributed to wild animals.Morning (6–12am) was found most common time of bite in 45(37.8%) cases. However in 29(24.4%) and 27(22.7%) cases, bites were noted at afternoon (12-5pm) and evening (5-8pm) respectively. A total of 18(15.1%) cases occurred at night.Lower limb was the most common site exposed to animal bite in 97(81.5%) cases.Other sites involved were upper limb 18(15.1%) followed by face 3(2.5%) and trunk 1(0.8%). In 30 (25.2%) cases multiple sites were involved in bites.

Table-2: Distribution of cases according to age group and category of exposure(n=119)

Age group (Years)	Exposure Category based on WHO guidelines[10] (%)			
	Category 1	Category II	Category III	Total
0 to 5	2(1.7)	1(0.8)	1(0.8)	4(3.4)
6 to 14	2(1.7)	6(5.1)	10(8.4)	18(15.1)
15 to 45	3(2.5)	20(16.8)	36(30.3)	59(49.6)
46 to 60	0(0)	7(5.9)	21(17.7)	28(23.5)
>60	1(0.8)	1(0.8)	8(6.7)	10(8.4)
Total	8(6.7)	35(29.4)	76(63.9)	119(100)

Majority, 76 (63.9%) of cases had category III exposure according to WHO guidelines. In all age group category III exposure was highest except 0-5 years of age-groups where category I exposure was highest.

Table 3: Duration between bite and wound cleaning (n=119):

Duration between bite and wound cleaning	Frequency (%)
< 1 hour	47 (39.5)
1 to 6 hours	51 (42.9)
7 to 24 hours	9 (7.5)
> 24 hours	2 (1.7)
missing	10(8.4)
Total	119(100)

Majority, 107 (89.9%) of victims had history of wound cleaning within 24 hours and out of them 47 (39.5%) victims had wound cleaning within 1 hour. 2 cases had history of wound washing after 24 hours.

Table 4: Educational status and duration between bite & first dose of ARV (n=115*)

Education Status	Duration between bite & firstdose of ARV (%)	
	Within 24 hours	> 24 hours
Illiterate	18 (15.6)	3 (2.6)
Just literate	6 (5.2)	0 (0)
Primary (up to 5^{th})	21 (18.3)	1 (0.9)
Middle (up to 8^{th})	25 (21.7)	0 (0)
Secondary (up to 10^{th})	23 (20)	1 (0.9)
Higher-secondary (up to 12^{th})	6 (5.2)	0 (0)
Graduation & above	10 (8.7)	1 (0.9)
Total	109 (94.7)	6 (5.3)

* 4 cases were below 6 years of age.

Majority 109(94.7%) of cases had received first dose of ARV within 24 hours. (Table 4)

Table-4 show details of educational status and duration between bite & first dose of ARV. Illiterate, Primary, Secondary and even shockingly graduate people had not taken first dose of ARV within 24 hours in 3, 1, 1 & 1 cases respectively. All cases received ARV by IM route. A total of 62 (52.9%) cases received TT vaccine. Only 17 (14.3%) cases received ARS, from which 10 cases received human ARS and 7 cases received equine ARS.

Table 5: Reason for coming late to health facility for first dose of ARV (after 24 hours) (n=6):

Reason for coming late(after 24 hours)	Frequency (%)
Ignorance regarding rabies prognosis	6 (100)
Staying away from Health facility	4 (66.7)
Lack of transportation	2 (33.3)

All 6 cases were not know about prognosis of rabies which was reason for their late coming for first dose of ARV while 4 of them gave reason that they were staying away from health facility.

Table 6: Categories of home treatment (n=80)*

Categories of home treatment	Frequency (%)
Local antiseptic	46 (57.5)
Only water	38 (47.5)
Soap & water	38 (47.5)
Chili Powder	5 (6.2)
Powder of Tea	2 (2.5)

** Responses are not mutually exclusive*

Total 80 cases had history of home treatment. Out of them, 46 (57.5%) cases had applied local antiseptic, 38 (47.5%) cases washed wound with only water, 38 (47.5%) cases washed wound with soap & water, 5 cases applied chilli powder and 2 cases applied powder of tea. A total of 44 (36.9%) cases had past history of animal bite. Out of them only 18(40.9%) had completed post exposure immunization. All of them received it through IM route. No history of vaccine reaction had been noted.

Discussion

Animal bites, especially dog bites still pose an important public health problem in urban area of our country.The epidemiological profile of animal bite cases in this study revealed that men are affected more than women, due

to occupational travelling of man outside of home as compared to women. Male to female ratio is 2.3:1 which is quite similar to previous studies.[11-17]Predominantly of cases belonged to 15-45 years of age group (49.6%) similar to Behera et al (2006).[15]Different studies found different age-group as predominance Jyoti et al[14] (below 15 years), Behera et al(2004)[16](below 10 years),Venu Shah et al[13] (below 25 years) and Icchapujani et al(2008)[12] (2-18 years).These findings are in contrast to our finding where we found only 18 % cases in age group of 0-14 years.In this study, biting animal includes dog and rat. In majority, 118(99.2%) of cases the biting animal was dog similar to other studies [11-17]. Stray animals were attributed to majority (85.7%) cases while pets(11.8%) and wild animals(1.7%) attributed to small proportion which were similar to findings of Beheraet al[15] and Icchapujani et al[12].Bites were unprovoked in half (50.4%) of the caseswhich was match with the study by Behera et al[15] and Icchapujani et al[12] in which they found unprovoked bites in 56.6% & 64.3 % cases respectively.In majority 113 (94.96%) of cases bites occurred within city. Lower limb was the most common site (81.5%) of bite similar to other studies[11-17].Other sites involved were upper limb (15.1%) followed by face (2.5%) and trunk (0.8%).In thirty cases multiple sites were involved in bites.Majority (37.8%) of bites occur between 6-12 am in the morning in contrast to study by Venu Shah et al[13] in which she described 38.8% of bites between 4 and 8 pm. Majority (63.9%) of cases had category III exposure according to WHO guidelines which is similar to studies where category III was most common.[11-13,15]In all age group category III exposure was highest except 0-5 years of age-groups where category I exposure was highest.Lower limb, face and multiple bites were found more commonly in category III exposure while upper limb bites were found more in category II exposure.

Only 63.9% cases had history of wound cleaning with running water or water with soap which was major issue of concern which include only 39.5% victims with history of wound cleaning within 1 hour. 2 cases had history of wound cleaning after 24 hours.Majority (94.7%) of cases had received first dose of ARV within 24 hours after exposure, which is in accordance with other studies.[13]Ignorance regarding prognosis of rabies and staying away from Health facility were major reasons for coming late (after 24 hours) to the health facilityfor first dose of ARV.Two third (67.2%) of animal bite victims had taken pre-treatment at home. Indigenous products like chili powder and powder of Tea were applied over the wound by 8.75% of home treatment cases which was also found in other studies.[11,12,13,15-17]At this health facility only 17 (14.3%) cases received ARS.Thirty seven percent of victims had previous history of bite, from them only 40.9% had completed post exposure immunization.

Conclusions

The incidence of dog bite cases in Bhuj is difficult to estimate as many dog bites are under reported. The stray dogs are main biting animal, affecting mostly the adult and old age persons. Majority bites are attributed to stray dogs and unprovoked, occurred during morning andinvolve lower limb as most common site and victimized adults and old aged people most. CAT III exposure was most common. Majority of cases had received first dose of ARV within 24 hours. Few cases used Indigenous products like chili powder and powder of tea on wound. Most common reason for coming late for first dose of ARV wasignorance regarding prognosis of rabies. All cases received ARV by IM route which is more costly than ID route which require attention. Post exposure prophylaxis was compromised in victims who had previous history of bite, which also require attention.

Recommendations

Proper information and education regarding rabies through mass media requires for false beliefs about the disease and deeply seated misconceptions about treatment of disease. This should be carried out at regular interval at health facility and at public places through IEC material. Young children are more prone to provoke

dog which results in a bite, so they require proper guidance by parents and teachers. Vaccination and municipal licensing of pet dogs must be enforced.

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