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Original Research Article

Epidemiological analysis of 1637 cases of animal bite injuries

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ABSTRACT

Background: This study was conducted prospectively over a period of two years in accident and emergency department of Government Medical College, Srinagar. The main objectives of the study included finding out epidemiological aspects of animal bites, categorising bites and analysing associated injuries.
Methods: From April 2009 to April 2011, more than 1800 patients presented to accident emergency department with injuries due to human animal conflict. Out of them, 1673 patients had only bite injuries and were treated on out patient basis were included in the study.
Results: Study revealed incidence in males (69.27%) being higher than in females. The age group most commonly involved was 0-10 years and rural population (60.72%) was more affected as compared to urban population. Furthermore, dogs were most common (88.46%) animals to be involved in bites. The commonest bite category was class 2 among all the bites (58.57%) while as type 1 was least common (9.74%). Injury pattern showed that most common site of bite was lower limbs, left leg (56.90%) being more common than the right.
Conclusions: We conclude from this study that animal bites usually involve age group of less than 10 years. Males and rural population are more commonly involved. Dog is most common animal involved in such conflicts. We found lower limbs are most common sites involved with left lower limb being more commonly bitten as compared to right.

Keywords: Animal bites, Bite category, Injury pattern, Rabies

INTRODUCTION

The human animal interaction is ancient. Anthro-zoology (also known as human–non-human-animal studies or HAS) is the study of interaction between humans and other animals. One of the most important aspect of this branch is the quantifying of the positive effects of human-animal relationships on either party and the study of their interactions.[1]

Among those interactions the bond between dogs and humans is enduring. But question arises, why do animals, particularly pet ones, bite? Well it is a conundrum. Human animal conflict dates back to the prehistoric times. The nature of conflict may have not changed a lot but perception about the outcome has changed a lot from past to present, earlier concern may have been about injury only but now infections like rabies are a priority to both patient as well as medical practitioners.

Diseases like rabies still remain a challenge in developing and underdeveloped world particularly South East Asia, with an estimated 45% deaths worldwide due to rabies occurring in that part.[2] The condition in India being more worse with about 36% of rabies deaths being reported worldwide and showing no decline in incidence from last one decade.[3,4]

This present study was carried in Northern State of India with a very high incidence of human - dog and human-wildlife conflicts.[5] With this background and scarcity of literature available regarding animal bites pattern, we carried out this study.

The study was conducted in one of the main tertiary care referral hospital of the state, having well established anti rabies clinic. The main purpose of study was finding out epidemiological aspects of animal bites, categorizing and analyzing bite associated injuries.

METHODS

This study was carried out in Accident Emergency Department of Medical college affiliated hospital. It is one of the main referral centres of the state having a well-established Anti Rabies Clinic. Study was carried from April 2009 to April 2011 and 1673 patients were included.

Inclusion criteria

- Patients who reported primarily to our hospital.
- Patients who were treated on Out-patient basis after primary management.
- Patients who provided detailed history.

Exclusion criteria

- Patients who were referred to our hospital after receiving primary treatment
- Patients who needed admission in hospital for more than 24 hours
- Patients who needed any operative surgery due to bite or bite related injury.

RESULTS

A total number of 1673 patients were included in study. All injuries were classified as per WHO Classification, Table 1.

Table 1: WHO classification of Animal Bites.

Class	Definition
I.	Touching or feeding of animals. Licks on intact skin
II.	Nibbling of uncovered skin. Minor scratches or abrasions without bleeding. Licks on broken skin
III.	Single or multiple transdermal bites or scratches. Contamination of mucous membrane with saliva (i.e. licks)

The number of male patients included 1134(69.27%) as compared to females 503(30.72%). Out of 1673, 994 (60.72%) patients belonged to rural areas while as 643(39.27%) patients were from urban areas, Table 2.

Table 2: Sex and Area distribution.

Distribution	Characteristics	
Sex distribution	Male	Female
	1134 (69.27%)	503 (30.72%)
Area distribution	Rural	Urban
	994 (60.72%)	643 (39.27%)

All patients were enquired about the animal involved. The most common animals implicated in bite cases were dogs, 1468, 89.67% Table 3.

Table: 3 Animals involved with corresponding age group distribution.

Age group	Dog	Bear	Cat	Horse	Monkey	Other	Total
0-10	496	7	0	0	3	21	528
11-20	279	2	2	1	2	27	312
21-30	185	2	0	2	1	14	204
31-40	234	2	2	3	2	26	269
>40	274	1	9	7	2	31	324
Total percentage	1468 (89.67)	14 (0.08)	13 (0.07)	13 (0.07)	10 (0.06)	119 (7.20)	1637

Table 4: Age group and bite category.

Age group	Class 1	Class 2	Class 3	
0-10	48	328	152	528 (31.55%)
11-20	35	180	97	312 (18.64%)
21-30	26	131	47	204 (12.19%)
31-40	34	156	79	269 (16.07%)
>40	20	185	119	324 (19.36%)
	163(9.74)	980(58.57)	494(29.52)	1673

The patients were divided into 4 age groups: 0 to 10,11 to 20,31 to 40 and more than 40 years. Highest incidence animal bites of 31.55 % was found in age group of 0-10 years, followed by age groups of >40 years and 11-20 having incidence of 19.36% and 18.64% respectively. Least common age group was 21-30 years having incidence of 12.19%, Table 4. Out of 1637 cases many patients had multiple bites. As such total number of bite injuries in these patients were about 1685. Lower limb was the most common site of bites constituting about 65.28% cases. Besides left lower limb was more commonly involved as compared to right, 57% vs 42%, Table 5.

Table 5: Site of involvement in bites.

Site	Total number		Most common age group involved
Head and neck	73 (04.30%)		0-10 years (47)
Upper limb	268 (15.90%)	Right Limb: 141 (52.61%) Left Limb: 109 (40.67%) Both Limbs:18 (6.71%)	0-10 years (84)
Lower limb	1100 (65.28%)	Right Limb: 464 (42.18%) Left Limb: 626 (56.90%) Both Limbs: 10 (0.9%)	0-10 years (327)
Trunk and other regions	244 (14.48%)		0-10 years (103)

The treatment part included thorough washing of wound, active immunization using cell derived vaccines. In category 3, local infiltration using ARS was also done. All patients received first dose free. Immunoglobulin had to be bought by patients on their own. If patients could not afford , same was provided by social organisation (Help Poor Foundation). For further doses patients were referred to different outlets of Anti Rabies Clinic as per area patient belonged.

DISCUSSION

About half of Americans will be bitten by an animal or another human being during their lifetimes, as such animal bites account for 1% of all emergency department visits.[6] It is estimated that 28% of all children have a calculated risk of being bitten by a dog at least once.[7] The study undertaken presently focused on epidemiological aspects of animal bites, categorizing and analyzing animal bite associated injuries. We could find good number of publications about rabies as well as bite associated infections but could not find much written about animal bite injury pattern and categorization of same.

The study revealed that rural population and males in particular had higher incidence in terms of total number of bites. This is in accordance with previous studies.[8-10] In addition we found that stray dogs were the main biting animals, similarly to other studies.[8-11] But in contrast to majority of other studies we found bear bites second in frequency rather than cat.

The main reason for the same can be explained on the basis that in the area of Jammu and Kashmir, as per world life SOS, there are highest number of human conflicts with Asiatic Black bears and leopards. We found that the most common age group being bitten by dogs were less than 10 years of age. The percentage being about 31.55%, which is less as seen in some studies in which 57% patients belonged to same group.[12-13] The difference can be understood from the fact that the previous studies have been conducted in developed countries where having pets is common. On another hand, our study has been carried out in a place where having pets is not common as it is often considered against social and religious customs. The second common age group bitten belonged to people aged more than 40, n= 324(19.36%) cases. The explanation can be given that after 40 years the strength is decreased and running away from animal may not be easy.

We estimated class of bite injuries. We found that Class 2 injuries being most common, 58.57%. But we feel Class 1 injuries were underestimated as minor cases are either treated locally or managed by primary care physicians, same has been noticed in other studies.[7] Finding exact incidence of same was beyond our study.

The final aspect of study was to analyse injury pattern in animal bites. We found that some patients had more than one bite, as such we had more bite injuries as compared to number of patients. The lower limb injuries were most common, n=1100. In lower limb, left limb bites 626 (56.90%) were much more than right limb 464 (42.18%). The reason for the same is that at the time of animal attack people try to run away using right leg first and as such left leg is often bitten.

In 10 patients both limbs were bitten. Upper limbs were involved next in frequency of bites; right limb bitten in

141 (52.61%); left Limb in109 (40.67%) and both limbs in18(6.71%). The results for upper limb are somewhat similar to other studies[14]. Trunk and abdomen injuries ranked third n=244(14.48%) while as head and neck region had minimum bites, n=73 (04.30%).

In contrast to other studies in India, we found that majority of patients we received had kept wound open (No Covering Dressing) and usually had applied some antiseptic. Although we also found that knowledge about wound washing was lacking in majority.[4]

CONCLUSION

We conclude from this study that animal bites usually involve age group of less than 10 years. Males and rural population are more commonly involved. Category 2 bites are most common ones seeking medical attention. Injury pattern revealed that lower limbs were the most commonly involved and left lower limb being more commonly bitten as compared to right.

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