

Incidence of Animal Bites and Stings in Sherpur, Bogura, Bangladesh

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ARTICLE INFO

Article history:

Received: 27 March 2017

Accepted: 07 July 2017

Online:

www.nbmc.ac.bd

Keywords:

Animal bite, Injuries, Health problems

ABSTRACT

Introduction: World Health Organization had estimated that 10 million animal bites around the world each year and about 50,000 people die annually from animal bite. This retrospective study was carried out from January 2016 to December 2016 at emergency department of Sherpur Upazila Health Complex (UHC) to determine the incidence and characteristics of the injuries caused by animals among the population of Sherpur, Bogura, Bangladesh. **Methods:** The medical records of 77 patients admitted to hospital with animal bites were studied. Data including epidemiological aspects, clinical findings and outcomes of treatment were analyzed using descriptive statistics and the χ^2 test. **Results:** Of 77 patients 54 (70.13%) were male, and the median age of males and females was 24.4 years and 26.2 years, respectively. Dogs, Cats, Fox, and Mice/muskrat were the most commonly involved animal species, causing injuries with a frequency of 38 (49.35%), 12 (15.58%), 15 (19.48%) and 7 (9.09%), respectively. Feet 39 (50.64%) and hands 27 (37.66%) were the most commonly affected body parts, followed by the face and other parts. No case of rabies was observed in these patients nor any case of death was reported. **Conclusion:** Animal bite is a major public health problem in Sherpur, Bogura, with a high rate of hospitalization but low rate of mortality.

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INTRODUCTION

World Health Organization states that 10 million people are bitten by animals around the world each year and are considered for prophylaxis and treatment for rabies, from which almost 50000 people die annually. The highest rates of mortality and morbidity in Asia were observed among developing countries.¹⁻³ It was found that most patients are bitten by dogs, and that a considerable proportion of these were young children, who were at greater risk of developing rabies in the absence of treatment due to the location of the bites they receive.⁴ In countries where animals, especially dogs, are kept in poor hygienic conditions, dog bites are the most common animal bites and can result in complicated bacterial infection, predominantly related to the dog's oral flora.^{5,6} Bites and scratches represent the most important public health issue related to dogs and cats because of the associated physical and psychological trauma, wound infection by different microorganisms, and the risk of rabies transmission.^{5,7,8-11} Cellulitis was the most common clinical feature, and rarely, sepsis, osteomyelitis and rabies may develop after bite injury.⁵ Vaccination against rabies before and after animal bite was the most effective measure to prevent rabies.^{4,5} Annually, 140 cases of animal bite per 100000 population were estimated to occur in Iran; more than 85% of them were dog bites.^{3,4} Khuzestan province is ranked ninth in the country in this respect. The high frequency of animal bites/stings (3000–6000 cases per year), due to large number of stray dogs, the high prevalence of scorpions and snakes in some areas of Khuzestan.¹⁴ This current study was performed to determine the incidence and characteristics of the injuries caused by animals among the population in the northern area of Bangladesh.

METHODS

This was a retrospective descriptive study performed using register books of the emergency department in Sherpur Upazila Health Complex(UHC), Sherpur, Bogura, Bangladesh. This health complex covers a population of 3,32,825. The medical records were of those persons who were bitten by animals between January 2016 to December 2016 and attended in the emergency departments of Sherpur UHC. Data were collected on age, gender, residence (rural or urban), type of animal, site of bite or sting, number of bites, symptoms, treatment and preventive measures carried out at the primary health center. Data were analyzed in SPSS 20 (SPSS- IBM Inc., Chicago, IL, USA) by using descriptive statistics and the 2 test.

RESULTS

During the period of study, 77 cases of animal bite were reported to Sherpur Upazila Health Complex. Of the 77 studied patients, 54 (70.13%) were male, and 23 (29.87%) were female. The age and gender distributions of patients with animal bites and stings are shown in Table I.

Table I: Age and gender distribution of patients with animal bites

Age (in years)	Number (%) of the patients		Total
	Male	Female	
1 to 10	21 (38.9%)	8 (34.8%)	29 (37.7%)
11 to 20	5 (9.3%)	2(8.7%)	7 (9.0%)
21 to 30	11 (20.4%)	4 (17.4%)	15 (19.5%)
31 to 40	8 (14.8%)	4 (17.4%)	12 (15.6%)
41 to 50	6(11.1%)	3 (13.0%)	9 (11.7%)
51 to 60	2 (3.7%)	0%	2 (2.6%)
>60	1 (1.8%)	2 (8.7%)	3 (3.9%)
Total	54	23	77

Dog, cat, fox, mouse and monkey bites were the most common, with frequencies of 38(49.35%), 12 (15.58%), 15 (19.48%), 7 (9.09%) and 3 (3.89%) respectively (Table II). Statistically significant differences in the number of animal bites between the rural and urban populations were

observed: Dogs (23, 60.53% versus 15, 39.47%), Mice (4, 57.15% versus 3, 42.85% respectively) and Foxes (11, 73.33% versus 4, 26.67% respectively) and cats (8, 66.67% versus 4, 3.33% respectively). Snakes had similar frequencies in rural and urban population (Table II).

Table II: Animal bites and stings according to animal species and patient's residence

Animal	Total	Total	
		Urban	Rural
Dogs	38 (49.35%)	15 (39.47%)	23 (60.53%)
Cats	12 (15.58%)	4 (33.33%)	8 (66.67%)
Foxes	15 (19.48%)	4 (26.67%)	11 (73.33%)
Monkeys	3 (3.89%)	1(33.33%)	2 (66.67%)
Mice/Muskrats	7 (9.09%)	3 (42.85%)	4 (57.15%)
Snake	2 (3.89%)	1 (50%)	1 (50%)

Animal bites and stings according to different animal species in relation to patient’s gender distributions are shown in Table III.

Table III: Animal bites and stings according to animal species and patient's gender

Animal	Number (%) of patient's gender		Total
	Male	Female	
Dogs	29 (76.32%)	9 (23.68%)	38 (49.35%)
Cats	5 (41.67%)	7 (58.33%)	12 (15.58%)
Foxes	13 (86.67%)	2 (13.33%)	15 (19.48%)
Monkeys	2 (66.67%)	1 (33.33%)	3 (3.89%)
Mice/Muskrats	4 (57.15%)	3 (42.85%)	7 (9.09%)
Snake	1 (50%)	1 (50%)	2 (3.89%)

Dogs, and snakes frequently affected the feet (23 in number), where as cats and mice affected the hand (10 in number)(Table IV). Multiple bites and injuries were observed to be caused by cats and dogs. Hospital medical records showed that 11 patients had infectious complications such as soft tissue infection (11,14.24%), sepsis (2, 2.59%). All patients with mammal bites were vaccinated

against rabies and treated with anti-rabies immunoglobulin and there were no cases of rabies among these patients.

Table IV: Body part affected according to animal species

Animal	Face (n%)	Hands (n%)	Foot (n%)	Other parts (n%)	Total
Dogs	2 (5.2%)	11 (28.9%)	22 (57.8%)	3 (7.8%)	38
Cats	1 (8.3%)	8 (66.6%)	2 (16.6%)	1 (8.3%)	12
Foxes	1 (6.6%)	4 (26.6%)	9 (60.0%)	1 (6.6%)	15
Monkeys	2 (66.6%)	1 (33.3%)	0 (0%)	0 (0%)	3
Mice/Muskrats	0 (0%)	2 (28.5%)	5 (71.43%)	0 (57.1%)	7
Snake	0 (0%)	1 (50%)	1 (50%)	0 (0%)	2

DISCUSSION

In this study health centers and hospital in the study region showed that, 4.2% of animal bites and stings were treated. This finding is consistent with previous reports that the majority of animal bites result in mild injuries that patients do not seek medical help for.^{6,16} Findings of this study that children and young adults were affected more than other age groups and men were affected more than women, with a male to female ratio of 2.3:1 (Table I). This findings are in agreement with Nogalski et al.,⁷ Weis et al.,¹² Hon et al.,¹³ Matteucci et al.¹⁷ and Shetty et al.¹⁸ O'Neil et al.¹⁶ Mac Bean et al.⁸ explained that female adults were more likely than male adults to be attacked by cats. The present study showed that dog bites constitute about 50% of all animal bites that affected people, while the remaining 50% were caused by other animals such as cats, foxes, monkeys, rats and snakes. Many investigators reported that dogs, cats and horses were the most common animals injuring humans.^{6,7,11,12,15,18,19} These differences might be due to variation in the behaviors, occupations and belief of people living in different socioeconomic and epidemiological situations. The present study revealed that most dog bites occurred in rural areas, whereas those bitten by mice, monkey were predominantly in urban areas. Snake bites

were similar in both areas. Nogalski et al.⁷ reported that the threat of animal attack is similar in urban and rural areas.⁷ MacBean et al.⁸ explained that in Australia, most injuries by animals occurred in the home and were caused by pet dogs and cats. These differences may be related to many factors, such as the high number of stray dogs in rural areas of the region of our study, the high number of mice in sewage canals and entering homes in urban areas of our region, the high number of pet dogs and cats in industrial countries, and differences in occupation, behaviour and socioeconomic background around the world. In our study, the majority of infectious complications were seen in dog bites and snake bites. This finding was confirmed by the data from another researcher.⁵ Two main factors are responsible for this observation. The first is the bacterial flora of dog and snake saliva, which infects human tissue, and the second factor is the trauma caused by powerful dog's jaws, which results in tissue ischemia in the region of the bite. In addition, the cytotoxic effects of snake toxin predispose the affected tissue to infection.^{5,6} In our study, the mortality rate in hospitalized patients was 0%. Nogalski et al.⁷ found that the mortality rate in hospitalized patients was 5.88%, mostly due to serious injuries caused by large animals such as horses, cows and pigs. Weis et al.¹² reported a mortality rate

among hospitalized animal bite patients of 1.6 per 1000. These differences may be due to: (1) the presence of potentially lethal scorpion species such as *Hemiscorpius lepturus* in the area, (2) severe and serious injuries to the head, face and abdomen caused by horses and cows, (3) the medical facilities and best management of injured patients in the emergency departments of industrialized countries. In the present study, it was observed no case of rabies or tetanus. The threat posed by rabies is increasing in Iran due to the high number of stray dogs and cases of dog bite in humans.³ Dao et al.¹⁹ reported 10 cases of human rabies in their retrospective study covering a four-year period (2000–2003). Dog bites caused maximum morbidity (92%). Second most common biting animal was monkey (3.2%), followed by cat (1.8%), fox (0.4%) etc. Most bites (64.3%) were unprovoked bites by stray (64.7%) animals. In this study, 72.4% animal bite victims were males and 47.5% were children in age group of 2-18 years and 63% had category III exposure as per the WHO classification.²⁰

CONCLUSION

From the present study it was concluded that dog, foxes, cats were mostly responsible for animal bites, snake for strings in this study area with no incidence of rabies. The study suggests Government concern as well as public awareness regarding animal bite, strings to reduce their incidences.

Acknowledgments:

The authors wish to thank the chief and other personnel of Sherpur Upazila Health Complex, Sherpur, Bogura, Bangladesh for supporting this study. We also acknowledge the emergency medical officers for their kind assistance in data collection.

Conflict of Interest There is no conflict of interest.

REFERENCES

1. World Health Organization (WHO). Rabies fact sheet. September 2014. Web page at: Accessed on November 2017.
2. World Health Organization (WHO). Annual report of the regional directory, Alexandria. WHO Regional office for the Eastern Mediterranean; 2003.
3. WHO. Strategies for the control and elimination of rabies in Asia. Geneva: WHO; 2001.
4. Fayaz A. The diseases with vector or reservoir: rabies. In: F. Azizi, H. Hatami, M. Janghorbani (Eds.). The epidemiology of animal bite injuries in Uganda and projections of the burden of rabies. Trop Med Int Health. 2005; 10(8): 790-798.
5. Tabatabaei SM, Zahraei M, Ahmadnia H, Ghotb M, Rahimi F. Principles of disease prevention and surveillance, 2nd ed. Tehran, Iran. Roohe Ghalam; 2006: p. 99–104.
6. Goldstein JC. Bites. In: Principles and practice of infectious diseases, 6th ed. New York: Churchill Livingstone; 2005.
7. Nogalski A, Jankiewicz L, Cwk G, Karski J, Matuszewski L. Animal related injuries treated at the Department of Trauma and Emergency Medicine, Medical University of Lublin. Ann Agric Environ Med. 2007; 14 (1): 57-61.
8. MacBean CE, Taylor DM, Ashby K. Animal and human bite injuries in Victoria 1998–2004. Med J Aust. 2007; 186: 38–40
9. Healy D. Fatal dog bites in New Zealand. N Z Med J. 2007; 120(1259): 2659–2663
10. Casterodale, L. Hospitalizations resulting from dog bite injuries. Alaska, 1991–2002. Int J Circumpolar Health. 2007; 66: 320–327.
11. Day H, Roesler JS, Kinde M. Hospital-treated dog bites in Minnesota, 1998–2005. Minn Med. 2007; 90(7): 43–45, 47.

12. Weis HB, Friedman DI, Coben JH. Incidence of dog bite injuries treated in emergency departments. *JAMA*. 1998; 279 (1): 51–53.
13. Hon KL, Fu CC, Chor CM, Tang PS, Leung TF, Man CY, et al. Issues associated with dog bite injuries in children and adolescents assessed at the emergency department. *Pediatr Emerg Care*. 2007; 23: 445–449.
14. Pipelzadeh MH, Jalali A, Taraz M, Pourabas R, Zaremirkabadi A. An epidemiological and clinical study on scorpionism by the Iranian scorpion *Hemiscorpius lepturus*. *Toxicon*. 2007; 50: 984–992.
15. Hashemi SA, Esfandiari B, Fayaz A, Nahrevanian H, Behzadi R, Kavosian S et al. Investigation on animal and human rabies in cases from Mazandran and Golestan provinces referred to the Amol Research Center, Northern Iran in 2003–2005. *Internet J Microbiol*. 2006; 4(1): 1-3.
16. O’Neil ME, Mack KA, Gilchrist J. Epidemiology of non-canine bite and sting injuries treated in USA emergency department, 2001–2004. *Public Health Rep*. 2007; 122: 764–775.
17. Matteucci MJ, Hannum JE, Niffenbergh RH, Clark RF. Pediatric sex group differences in location of snake bite injuries requiring antivenom therapy. *J Med Toxicol* 2007; 3: 145–148.
18. Shetty RA, Chaturvedi S, Singh Z. Profile of animal bite cases in Pune. *J Commun Dis*. 2005; 37(1): 66–72.
19. Dao S, Abdillahi AM, Bougoudog F, Toure K, Simbe, C. Epidemiological aspects of human and animal rabies in the urban area of Bamaka Mali. *Bull Soc Pathol Exot*. 2006; 99(3): 183–186.
20. Ichhpujani RL, Mala C, Veena M, Sing J, Bhardwaj M, Bhattacharya D, et al. Epidemiology of animal bite and rabies cases in India. A multicentric study. *J Commun Dis*. 2008; 40(1): 27-36.