

TEN YEARS SURVEY OF ANIMAL BITES IN KHUZESTAN

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ABSTRACT

Objectives: Animal bites and stings are among the most common injuries in Iran and worldwide. The aim of this study was to determine the incidence and characteristics of the injuries caused by animal in the population of Khuzestan admitted in educational hospital emergency departments.

Methodology: In this retrospective study medical records of 894 admitted patients with animal bite or sting were studied. Data including epidemiological aspects, clinical findings and outcomes of treatment were analyzed in SPSS 11.5 by using descriptive statistics and chi-square test.

Results: Out of total 894 patients 61.9% were male, median age of male and female was 24.4 years and 26.2 years respectively. Dog, scorpion, mouse and snake were the most common animal species with the frequency of 69%, 12.6%, 8.8% and 4.4% respectively. Feet (58.05%) and hands (30.65%) were the most common body part affected, followed by face and other parts. One hundred Twenty seven patients had infectious complications, among them soft tissue infection 94(74.05%), sepsis 28(22.04%) and endocarditis 5(3.91%). Thirty five case (3.91%) died of animal bites and stings, among them 28(80%) due to scorpion sting, 4(11.4%) related to dog and 3(8.6%) from snake bite. No rabid case was observed in these patients.

Conclusions: Animal bite is a major public health problem in Khuzestan with a high frequency, significantly high percentage of hospitalization and considerable mortality.

KEYWORDS: Dog bites, Scorpion stings, Animal injuries, Rabies.

Pak J Med Sci April - June 2009 (Part-II) Vol. 25 No. 3 370-374

How to cite this article:

Alavi SM, Alavi L. Ten years survey of animal bites in Khuzestan. Pak J Med Sci 2009;25(3): 370-374.

INTRODUCTION

According to WHO report, ten million people are bitten by animals around the world, considered for prophylaxis and treatment against rabies and almost 50000 people die from this disease annually. The highest rates of mortality and morbidity in Asia are observed among developing countries.¹⁻³ Animal bites and stings are among the most common injuries in Iran and worldwide.⁴ In the countries that animal and especially dogs have poor sanitation, dog bites are the most common animal bites and result in complicated bacterial infection predominantly related to dog's oral flora.^{5,6} Bites and scratches represent the most important public health issue related to dogs and cats

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* Received for Publication: March 9, 2008

* Accepted: May 16, 2009

because of the associated physical and psychological trauma, wound infection by different microorganisms and the risk of rabies transmission.^{5,7-11}

Cellulitis (the most common clinical feature), rarely sepsis, osteomyelitis and rabies may develop after bite injury.⁵ Vaccination against rabies before and after animal bite is the most effective measure to prevent rabies.^{4,5} Scorpion and snake stings are another serious and fatal animal exposure in Iran with similar frequency and health impact.^{4,12,13} Annually 140 cases per hundred thousand population animal bites are estimated to occur in Iran; more than 85% of them are dog bites.^{4,3} Khuzestan province, from this view is in 9th ranking in the country. Due to high frequency of animal bites / stings (nearly 3000-6000 case per year), large number of ownerless dogs, some high prevalence of scorpion/snake area in Khuzestan¹⁴ and small epidemiological data about this major public health problem, this study was performed to determine the incidence and characteristics of the injuries caused by animal in the population of Khuzestan admitted in educational hospital emergency departments.

METHODOLOGY

This is a retrospective descriptive study which was performed in Khuzestan province southwest Iran with a population of 4,480,000. Medical records of those who were bitten or stung by animals since 1997 until 2006 were reviewed. All medical records of patients contributed to animal exposure in Khuzestan Health Center (KHC) and educational hospitals affiliated to Jondishapour University of Medical Sciences (JUMS) were reviewed. Data about age, gender, residency, kind of animal, site of bite or sting, numbers of bites, previous vaccination against rabies and tetani, complaints of patients, treatment and preventive measures that were taken in primary health center, laboratory, clinical feature, complications, disabilities, deaths and days or weeks after occurrence these injuries derived out and were analyzed. Data were analyzed in SPSS

(11.5, USA) by using descriptive statistics and chi-square test.

RESULTS

During the period of study, 44088 cases of animal bites had been reported to KHC. The majority of animal bites had been so mild that after receiving anti venom (specific for scorpion or snake) and vaccination for rabies and tetanus (recommend of complete vaccination) were discharged. So, we found only 1872 medical files containing animal bites and stings, out of them only 894 medical records were reliable for this study. The rate of hospital admission for animal bites and stings was 4.24%.

Of total 894 studied patients 61.9% were male, median age of male and female was 24.4 years and 26.2 years respectively. Age and sex distribution of patients with animal bites and stings are shown in Table-I. Dog, scorpion, mouse and snake were the most common animal species with the frequency of 69%, 12.6%, 8.8% and 4.4% respectively. Animal bites / stings according to animal species and patient's residence are shown in Table-II. Feet (58.05%) and hands (30.65%) were the most common body part affected, followed by face and other parts (Table-III). Scorpion stings were retreated at emergency department with specific anti-venin against *Hemiscorpius lepturus*, the most fatal scorpion after diagnosed by trained health care worker. Seventy two patients were

Table-I: age and sex distribution of patients with animal bites and stings

Sex/age (years)		Bite/sting	
		No.	percent
Sex	Male	554	61.9
	Female	340	38.1
Age	Less than 5	45	5.0
	5-15	214	23.9
	15-25	251	28.1
	25-35	221	24.8
	35-65	135	15.1
	More than 65	28	3.1
Total		894	100

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

Animal	Total No. (%)	Rural area No. (%)	Urban area No. (%)	P-value
Dog	617(69)	494(79.4)	123(45.2)	<0.0001
Cow	11(1.2)	9(1.4)	2(0.7)	0.30
Donkey	8(0.9)	8(1.3)	0(00)	0.053
Mouse	79(8.8)	7(1.2)	72(26.5)	<0.0001
Cat	28(3.1)	14(2.3)	14(5.1)	0.021
Scorpion	112(12.6)	60(9.6)	52(19.2)	0.0001
Snake	39(4.4)	30(4.8)	9(3.3)	0.20
Total	894(100)	622(100)	272(100)	

diagnosed as stung by *H.lepturus*. Statistical significant difference in animal bites between rural and urban population (Table-II) were observed (dogs, 79.4% vs. 45.2% respectively), (mouse, 1.2% vs. 26.5% respectively) and (scorpion 9.6% vs. 19.2% respectively). Cow and snake had similar bite frequency in rural and urban population (Table-II). Dog, scorpion and snake frequently affected foot with the rate of 60-70%, whereas cat and mouse affected hand with frequency of 40-45% (Table-III). Multiple bites and injuries were observed by cat and dog with frequency of 20% and 8% respectively. Hospital medical records showed that 127 patients had infectious complications such as: soft tissue infection 94(74.05%), sepsis 28(22.04%) and endocarditis 5(3.91%). All patients with mammalian animal bites were vaccinated against rabies (and with anti rabies immunoglobulin -RIG) and there was no rabid case in these patients. Thirty five patients (3.91%) died of animal bites and stings, among them 28(80%) due to scorpion sting, 4(11.4%) related to dog bite or injury and 3(8.6%) from snake bite. Ten patients had disability with

chronic hemodialysis (two cases) and leg paralysis (8 cases) due to scorpion sting and dog induced injuries respectively. Death rate among patients with scorpion sting was 25%, mostly due to *H.lepturus* (94.3%).

DISCUSSION

The present study showed that 4.24% of estimated animal bites and stings were recorded in health centers or hospitals of the region of study. This finding is consistent with previous reports that majority of animal bites result in mild injuries for which patients do not call for medical help.^{6,15-17} In this study children and young adults were affected more than other age groups. In our study also men were affected more than women with the male to female ratio of 1.63:1. This finding is in agreement with Nogalski et al,⁶ Weis et al,¹¹ Hon et al,¹² Matteucci et al¹⁸ and Sheety et al¹⁹ reports. O'Neil et al¹⁷ and Mac Bean et al⁷ explained that female adults were more likely than male adults to be attacked by cats. This study showed that dog bites constitute about 70% of all animal bites that affect people, nearly 12%

Table-III: Body part affected according to main animal species

Animal	Face No.(%)	Hand No. (%)	Foot No. (%)	Other parts No. (%)	Total
Dog	31(5.02)	185(29.98)	370(59.96)	31(5.02)	617
Cat	5(17.85)	12(42.85)	9(32.14)	2(7.14)	28
Mouse	15(18.98)	36(28.44)	23(29.11)	5(6.32)	79
Scorpion	2(1.78)	28(25)	73(65.17)	9(8.03)	112
Snake	0(0.00)	11(28.2)	28(72.80)	0(0.00)	39
Other animal	0(0.00)	2(10.53)	16(84.21)	1(5.26)	19
Total	53(5.93)	274(30.65)	519(58.05)	48(5.37)	894

are scorpion stings and about 9% are mouse bites while the remaining 9% are caused by other animals such as cat and snake. Mac Bean et al, Hon et al, Weiss et al, Nogalski et al, Shetty et al, Dao et al, Ndon et al, have all reported that dogs with 80%, cats with 10% and horses with 10% are the most common animal sources.^{6,7,11,12,16,19,20} This difference may be due to variation in behaviors, occupations and beliefs of peoples living in different socioeconomic and epidemiological situation. The present study revealed that most dog bites occurred in rural area whereas those bitten by mouse, cat and scorpion were in urban area. Cattle's injuries and snake stings were similar in rural and in urban area. Nogalski, et al reported that the threat of animal attack is similar in urban and in rural area.⁶ Mac Bean and et al in their work explained that most of the animal injuries occurred in the home and by the pet dog and cat. These differences may be related to many factors such as: high number of stray dogs in rural area in the region of our study, high number of mouse in sewage canals and entering to homes in urban area of the region of study, high number of pet dogs and cats in industrial countries and differences in occupation, behaviors and socioeconomics in different area around the world. In our study majority of infectious complications were induced by dog and snake bites. This finding is confirmed by the data from the literatures.⁵

Two main factors are responsible for such infectious complications. The first is bacterial flora in the dog and snake saliva which infects human tissue, the second factor is powerful dog's jaws that induce tissue ischemia in the region of bite. Beside these mentioned factors cytotoxic effects of snake toxin predispose the affected tissue to infection.^{5,6} In this study mortality rate in hospitalized patients was 3.91%, among them scorpion sting with the rate of 80% was the most fatal injury. Nogalski et al, in their work explained that mortality rate in hospitalized patients was 5.88% mostly due to serious injuries caused by large animals such as horse, cow and pig. Weiss in his work reported that mortality rate among hospitalized

animal bite patients was 1.6 per thousand.

These differences may be due to:

1. Scorpion species such as *H. lepturus* as the most fatal scorpion in the area,
2. Severe and serious injuries to head, face and abdomen in the horse and cow induced injuries,
3. Medical facilities and best management of injured patients in emergency department of industrial countries. In the present study we observed no case of rabies or tetanus. Rabies as a dangerous disease is expanding due to the high number of stray dogs and human cases of dog biting.³ Dao et al, reported 10 case of human rabies in their retrospective study²⁰ during 4 years period (2000-2003). However, it is surprising, no cases of human rabies was observed in our study. This is because of health education of people and upgrading of health and treatment centers. All health centers in the region of study provide post exposure anti rabies treatment including vaccination, immunoglobulin and wound washing.

Strengths and limitations of the study: All cities and villages in the region of study as well as age group were included. The limitations are that the numbers is small of those with serious injuries requiring hospitalization, so, these results don't reflect the full scale of the problem. Secondly results of treatment were estimated at the time of discharge, but not in remote time so; these results may have some inaccuracies.

ACKNOWLEDGMENT

The authors wish to thank the chief and personnel of Jondishapour Infectious and Tropical Research Center for supporting of this study. We also acknowledge Dr. Kamali the chief of the zoonosis department of KHC and health students Mr. Savari and Mr. Haghjoo for kindly assistance in data collection.

Conflict of interest: There is no conflict of interest.

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