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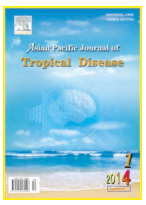

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The prevalence of animal bite during 2004-2008 in Islamabad-Gharb County, Kermanshah Province, Western Iran

Hamid Kassiri[1*], Ali Kassiri[2], Mehdi Pourpolad-Fard[1], Masoud Lotfi[1]

[1]*School of Health, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran*

[2]*School of Medicine, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran*

PEER REVIEW

Peer reviewer

Dr. Ahmad Farajzadeh, Associate Professor, Head of Department of Medical Microbiology, School of Medicine, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.
Tel: 0098-611-3330074
Fax: 0098-611-3332036
E-mail: Farajzadehah@gmail.com

Comments

It is a good research which the authors studied the prevalence and epidemiology of bites in Western Iran. The findings are attractive and indicated that animal bites were frequently by dogs, in summer, males and age group of 10-19 years old.
Details on Page S345

ABSTRACT

Objective: To determine the epidemiology of animal bites in in Islamabad-Gharb County, Western Iran during the years 2004-2008.

Methods: This is a case series research that explains biting incidents. In this descriptive study, all the data were gathered from each case by experienced personnel. Pending a 5-year course, by a questionnaire, bitten individuals listed into this research. The essential information of animal bite cases, such as age, gender, job, residence site (rural or urban) and bite place on the body were collected. Data were analyzed using descriptive statistics by SPSS version 18.

Results: The results of this study showed that the mean incidence rate of animal bites within 2004-2008 was 2.6/1 000 people. The highest incidence was observed in 2004 (3.3/1 000 people). The total number of animal bites was 2 864 cases. From all who were injured by rabid animals, 96.5% were living in rural areas and 3.5% in cities. The cases were mostly males (72.5%). The most highly affected age group was 10-19 years old individuals (26%). Bites were most frequent among students (29.7%). Feet were the most common bite site (75.8%). Nearly 96.7% were bitten by dogs and 2.4% by cats. The maximum frequencies of animal bites were in the summer (29.7%).

Conclusions: The findings indicate that biting incidents are common in Islamabad-Gharb County thus control measures are needed to decrease the prevalence rate of this difficulty.

KEYWORDS

Epidemiology, Animal biting, Prevalence rate, Rabies, Islamabad-Gharb County, Iran

1. Introduction

Animal bite is an important menace to human well-being due to mortality of further infections like rabies. Animal bite is preventable, but it is a health challenge in plenty of countries, chiefly in Africa and Asia. Each year, rather than 15 000 000 people take post-exposure prophylaxis, mostly in China and India. More than 55 000 people die of rabies annually mainly in Africa and Asia. Around 40% of individuals who are injured by dubitable animals are children less than 15years old[1,2].

Depending on epidemiology, rabies is discovered in domestic and wild types. The disease is prevalent in most of Asia, Africa and small sections of North America and Northern South America. Rabies is widespread to both the native and wild types in most provinces of Iran[3]. Rabies is endemic in Iran and happens mostly in tame animals[4-6].

*Corresponding author: Hamid Kassiri, School of Health, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.
Tel: +986113738269
Fax: +986113738282
E-mail: Hamid.Kassiri@yahoo.com

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Enhanced yearly animal bites can increase the quantities of expenses due to importing of anti-rabies vaccine and serum. Furthermore, rabies has a great mortality rate, such that after the apparition of the clinical signs in humans or in animals it is not treatable and the dying is unavoidable[7,8].

The principal reservoirs of rabies in various geographical regions are significant wildlife which are major reservoirs for disease. In the United States, skunk(in the West), fox(in the East) and raccoon(in Florida) are the principal reservoirs for the rabies[9]. Dogs have the most major designation in transmission rabies to humans[2].

Biting by dogs more over bacterial infections transmit rabies, tetanus, and tularemia while biting by cats can cause transmission of rabies also tetanus. Biting and scratching by cat could also transfer *Bartonellahenselae*(causes cat scratch disease) and *Francisella tularensis* (causes tularemia)[10].

In the Northern Iran, dogs and foxes while in the West and North-West of Iran wolves are the most major disease vectors and reservoirs. To date, the pathogen of rabies has not been separated from bats in Iran[11,12].

In multitude researches, animal bites cases have been reported for various age groups. Pursuant to the WHO announcements, maximum cases of human rabies happened in boys under 15 years old and 40% of sicks aged 5-14 years[13]. But in Pandey *et al*'s survey on foreigns' residents and tourists in Nepal that displayed more women than men have been injured by animals. The animal bites cases were greater for males in other studies[14].

Overall, many agents must be noticed in the designing of rabies control program and the first function is the care and epidemiologic data collecting. According to the great amount of rural people in Islamabad-Gharb County, holding dogs in buildings added prevalence rate of animal bites in last years. The urgency of epidemiological study was felton animal bites. This research could suggest the methods for controlling disease and decreasing the animal bites in the Islamabad-Gharb County.

2. Materials and methods

This research was done on sicks with animal bite recoursing to ant rabies center in the Islamabad-Gharb County, Kermanshah Province, Western Iran, from 2004 to 2008. In this descriptive research, data were gathered via a questionnaire including questions about the specifications of the bitten individuals including job, gender, age, biting animals, bite site on the body and residence area (city or suburb). Bitten people were classified into seven age groups containing <4, 5-9, 10-19, 20-29, 30-39, 40-49 and >50. Data analysis using SPSS and Excel softwares was performed.

3. Results

The results showed that 2 864 cases of animal bites in rabies vaccination centers had been referred during the years of 2004-2008. The average incidence rate for the whole County was approximately 2.6 per 1 000 population. There was a decreased incidence rate for animal biting during the above five years with 3.3, 2.8, 2.5, 2.2 and 2.2 per 1 000 population, respectively. Figure 1 shows the trend of animal bites cases during the study period.

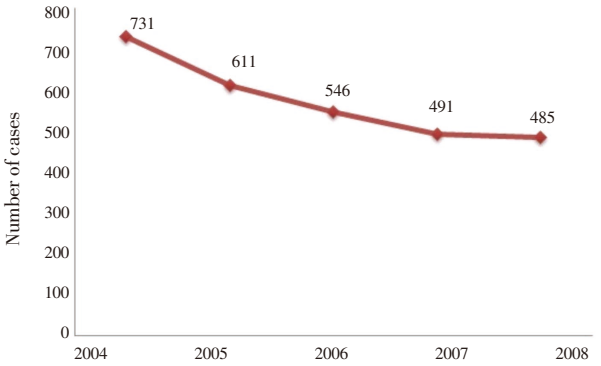

Figure 1. Trend of animal bites frequency in Islamabad-Gharb County, Kermanshah Province, Western Iran (2004-2008).

Animal bites were frequent among the age group of 10-19 years (26.0%) (Table 1). Depending on month, animal bites in August (11.7%) were higher than other months, however the lowest rates were recorded in January (5.8%) (Table 2). Seasonally, animal bites cases were documented in summer (29.7%), spring (28.9%), winter (21.7%) and autumn (19.7%), respectively. The findings from this study indicated that the animal bites cases during all months of 2004-2008 were higher in males than in females. During these five years, a total of 2 864 animal bites in both gender were recorded with 2 075 (72.5%) in males and 789 (27.5%) in females (Table 3). According to extracted results, animal bites rate in males were approximately documented 2.6 times more than the females (Table 3).

Table 1

Age distribution of animal bites cases in Islamabad-Gharb County, Kermanshah Province, Western Iran (2004-2008).

Years	2004	2005	2006	2007	2008	Total
Age groups	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)
<4	15 (2.1)	13 (2.1)	6 (1.1)	8 (1.6)	10 (2.1)	52 (1.8)
5-9	81 (11.1)	62 (10.1)	45 (8.2)	42 (8.6)	46 (9.5)	276 (9.6)
10-19	210 (28.7)	166 (27.2)	120 (22.0)	126 (25.7)	123 (25.3)	745 (26.0)
20-29	109 (14.9)	109 (17.8)	115 (21.1)	99 (20.2)	69 (14.2)	501 (17.5)
30-39	88 (12.0)	78 (12.8)	74 (13.5)	62 (12.6)	69 (14.2)	371 (13.0)
40-49	74 (10.1)	59 (10.0)	55 (10.1)	47 (9.6)	49 (10.1)	284 (9.9)
>50	154 (21.1)	124 (20.3)	131 (24.0)	107 (21.7)	119 (24.5)	635 (22.2)
Total	731 (100)	611 (100)	546 (100)	491 (100)	485 (100)	2 864 (100)

Table 2

Frequency distribution of animal bites cases by month in Islamabad-Gharb County, Kermanshah Province, Western Iran (2004-2008).

Years	2004	2005	2006	2007	2008	Total
Months	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)
April	71 (9.7)	83 (13.6)	54 (9.9)	45 (9.1)	28 (5.8)	281 (9.8)
May	77 (10.5)	51 (8.3)	43 (7.9)	65 (13.2)	33 (6.8)	269 (9.4)
July	66 (9.1)	74 (12.1)	43 (7.9)	53 (10.7)	41 (8.5)	277 (9.7)
June	48 (6.6)	87 (14.2)	71 (13.0)	26 (5.2)	53 (10.9)	285 (10.0)
August	62 (8.5)	101 (16.6)	65(11.9)	55 (11.3)	53 (10.9)	336 (11.7)
September	54 (7.4)	41 (6.7)	47 (8.6)	33 (6.7)	53 (10.9)	228 (8.0)
October	45 (6.2)	20 (3.3)	47 (8.6)	22 (4.4)	42 (8.7)	176 (6.1)
November	61 (8.3)	25 (4.1)	39 (7.1)	34 (6.9)	41 (8.5)	200 (7.0)
December	69 (9.4)	23 (3.8)	35 (6.4)	33 (6.7)	30 (6.2)	190 (6.6)
January	44 (6.0)	21 (3.4)	35 (6.4)	29 (5.9)	38 (7.8)	167 (5.8)
February	63 (8.6)	43 (7.0)	28 (5.1)	41 (8.3)	37 (7.6)	212 (7.4)
March	71 (9.7)	42 (6.9)	39 (7.1)	55 (11.2)	36 (7.4)	243 (8.5)
Total	731 (100)	611 (100)	546 (100)	491 (100)	485 (100)	2864 (100)

Table 3

Frequency distribution of animal bites cases by sex in Islamabad-Gharb County, Kermanshah Province, Western Iran (2004-2008).

Sexes	Male	Female	Total
Years	No. (%)	No. (%)	No. (%)
2004	538 (73.6)	193 (26.4)	731 (100)
2005	429 (70.2)	182 (29.8)	611 (100)
2006	389 (71.2)	157 (28.8)	546 (100)
2007	373 (76.0)	118 (24.0)	491 (100)
2008	346 (71.3)	139 (28.7)	485 (100)
Total	2075 (72.5)	789 (27.5)	2864 (100)

Table 4

Frequency distribution of animal bites cases by residential areas in Islamabad-Gharb County, Kermanshah Province, Western Iran (2004-2008).

Residential area	Urban	Rural	Total
Years	No. (%)	No. (%)	No. (%)
2004	24 (3.3)	707 (96.7)	731 (100)
2005	22 (3.6)	589 (96.4)	611 (100)
2006	6 (1.1)	540 (98.9)	546 (100)
2007	13 (2.6)	478 (97.4)	491 (100)
2008	36 (7.4)	449 (92.6)	485 (100)
Total	101 (3.5)	2763 (96.5)	2864 (100)

Table 5

Frequency distribution of animal bites cases by bite sites on the body (feet, hands, trunks, heads-faces and necks) in Islamabad-Gharb County, Kermanshah Province, Western Iran (2004-2008).

Years	2004	2005	2006	2007	2008	Total
Bite sites	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)
Hands	115 (15.7)	112 (18.3)	104 (19.0)	91 (18.5)	85 (17.5)	507 (17.7)
Feet	580 (79.4)	432 (70.7)	414 (75.9)	367 (74.8)	378 (77.9)	2171 (75.8)
Heads & Faces	6 (0.8)	9 (1.6)	6 (1.1)	3 (0.6)	9 (1.9)	33 (1.2)
Necks	2 (0.3)	7 (1.1)	1 (0.2)	1 (0.2)	0 (0.0)	11 (0.4)
Trunks	28 (3.8)	51 (8.3)	21 (3.8)	29 (5.9)	13 (2.7)	142 (4.9)
Total	731 (100)	611 (100)	546 (100)	491 (100)	485 (100)	2864 (100)

Around 96.5% bites were occurred in rural areas in Islamabad-Gharb County, which were 27.4 times more than urban areas (Table 4). The majority of patients had been wounded on their feet (75.8%) (Table 5). Most of the cases were students (29.7%) (Table 6). Based on the research findings in Table 7, during 2004-2008, the majority animal bites occurred by dogs is 96.7% followed by cats (2.37%).

Table 6

Frequency distribution of animal bites cases by occupation in Islamabad-Gharb County, Kermanshah Province, Western Iran (2004-2008).

Years	2004	2005	2006	2007	2008	Total
Job groups	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)
Rancher	26 (3.6)	26 (4.3)	27 (4.9)	12 (2.4)	13 (2.7)	104 (3.6)
Farmer	198 (27.0)	154 (25.2)	151 (27.7)	138 (28.1)	84 (17.3)	725 (25.3)
Employee	13 (1.8)	15 (2.4)	10 (1.8)	13 (2.6)	6 (1.2)	57 (2.0)
Self employment	47 (6.4)	36 (5.9)	31 (5.7)	36 (7.3)	46 (9.5)	196 (6.8)
Worker	26 (3.6)	11 (1.8)	19 (3.5)	17 (3.5)	25 (5.2)	98 (3.4)
Housewife	118 (16.1)	118 (19.3)	111 (20.3)	85 (17.3)	79 (16.3)	511 (17.9)
Student	235 (32.2)	193 (31.6)	139 (25.5)	150 (30.6)	135 (27.9)	852 (29.7)
Others	68 (9.3)	58 (9.5)	58 (10.6)	40 (8.2)	97 (20.0)	321 (11.2)
Total	731 (100)	611 (100)	546 (100)	491 (100)	485 (100)	2864 (100)

Table 7

Frequency distribution of animal bites cases by biting animals in Islamabad-Gharb County, Kermanshah Province, Western Iran (2004-2008).

Biting animals	Dog	Cat	Wolf	Jackal	Fox
Years	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)
2004	719 (98.5)	4 (0.5)	1 (0.1)	1 (0.1)	6 (0.8)
2005	598 (97.9)	13 (2.1)	0 (0.0)	0 (0.0)	0 (0.0)
2006	531 (97.3)	13 (2.4)	0 (0.0)	0 (0.0)	2 (0.4)
2007	459 (93.5)	19 (3.9)	13 (2.6)	0 (0.0)	0 (0.0)
2008	463 (95.5)	19 (3.9)	3 (0.6)	0 (0.0)	0 (0.0)
Total	2770 (96.7)	68 (2.37)	17 (0.6)	1 (0.03)	8 (0.3)

4. Discussion

The study of animal bites cases over 5 years (2004-2008) has been carried out to investigate the cases referred to animal bites vaccination centers, in Islamabd-Gharb County, Kermanshah Province, Western Iran. The majority of animal bites (26%) were in the age group of 10-19 years. Majidpour *et al*'s study in Ardabil Province indicated that most victims (44.13%) were in the age group of 10-29 years old as well as the highest incidence rate (6.63%) was in the age group 30-50 years old[1]. In the study of Zeynali and colleagues, half of the victims belonged to the age group of 10-29 years[15]. The study of mammalian bites conducted by Tepsumethanon and colleagues in Thailand documented 42.3% animal bites in the age group 10-14 years old and 39.7% in the age group 5-9 years old[16]. The study of Pandey and colleagues found that children were at higher risk for head and face bitten injuries[14]. Singh and colleagues in India showed that the incidence rate of animal bites in the age group of 5-14 years was high[17]. In another study, the mean age for animal bites was 6.7 years in children under 14 years old[18]. A study conducted in Pennsylvania, USA, found different results

and was inconsistent with other studies so that the highest incidence was reported in children under 5 years old (324/100 000)[19]. The WHO reports, the majority of human rabies cases occurred in boys under 15 years old and 40% of patients aged 5–14 years old[13].

During these five years (2004–2008), 2 075 (72.5%) and 789 (27.5%) cases of animal bites occurred in males and females, respectively. The animal bites rate in male gender was 2.6 times further that of the female gender. Except for Pandey and colleagues' study on foreigns' residents and tourists in Nepal that more women than men have been bitten by rabid animals[14], the other studies reported that more men than women have been exposed to animal bites. The obtained results from this study were also similar to some of mentioned studies[15,17,19].

In the present study, dogs were responsible for 2 770 (96.7%) cases of animal bites which was consistent with the results obtained from other studies. In the study of Majidpour and colleagues in Ardabil Province, in the majority of cases (96%) dogs were in charge. It is noteworthy that in the present study and the Majidpour and colleagues' study[1], the bites by dog was documented 10% further in comparison to other studies in different regions of Iran[15]. A research in Srilanka, showed that 95%–97% of the rabies patients were infected by dogs[20].

In this study, the majority of animal bites cases (96.5%) occurred in rural inhabitants. A study by the Iranian Institute Pasteur on 136 patients who had died of rabies, showed the highest percentage of deaths (30%) were in 10–19 age group, males (77%), rural inhabitants (83%) and in 68% of cases the dog was in charge[21]. Sadeghi and colleagues in West Azerbaijan Province documented that 63.4% bites in males, 35% in 10–19 age group, 81.6% in rural areas and 93.7% cases were bitten through dogs[22]. As for the results of this study, the Pasteur Institute of Iran and Sadeghi have had an undeniable attunement. Due to the high incidence of animal bites by dogs in rural communities in Islamabad-Gharb County, the need for fighting against stray dogs would be doubled.

In the present study, the main bite site of the body was feet. Of 2 864 victims of animal bites, in 2 171 cases (75.8%) the feet were the most important bitten sites. Tepsumethanon and colleagues in their study showed that the most common injury site on the body was feet (56.6%) [16]. Other researchers in this field have come up with similar findings[20]. Household and domestic dog bites in children proved higher rates for facial trauma[14,23]. Majidpour *et al*'s study on 4 331 cases of animal bites in Ardabil Province showed that 3 078 cases (71.79%) had been bitten in the feet[1]. The study of animal bites in Kerman Province reported that the most affected sites of the body were feet (47%), hands (41%), trunks (7%), heads and faces (3%) and necks (2%)[24].

In the present study, rate of animal bites in spring, summer, autumn and winter were 28.9%, 29.7%, 19.7% and 21.7%, respectively. Majidpour *et al*'s study of animal bites showed that the most cases occurred in summer. Seasonal distribution of the animal bites was 28.3% in spring, 29.6% in summer, 20.8% in autumn and 21.2% occurred in winter[1]. However, in Sadeghi and colleagues' study, most cases of bites (39.4%) in spring and lowest (16.4%) occurred in autumn[22]. In the present study, the most animal bites happened, in order, during August (11.7%), June (10%), April (9.8%) and July (9.7%) while the lowest during January (5.8%), October (6.1%) and December (6.6%). In West Azarbaidjan Province in 2000, the most animal bites cases (24.4%) occurred in May and the lowest (4.8%) found in November[22]. The study of animal bites in 2000 in Ardabil Province appeared that the most cases were in August, November, December and September, respectively[1].

The present study showed that in terms of the occupation,the students (29.7%) and farmers (25.3%) had higher rate of animal bite injuries. In this regard, the findings are consistent with Zeinali and colleagues' study[15]. In Majidpour *et al*'s study, 29.1% students, 18.9% farmers, 12.71% housewives, 8.64% ranchers, 8.9% workers and only 4% were the government employees. Sadeghi and colleagues reported that 1 871 cases of animal bites (48%) occurred in students[22].

It is counseled to start suitable public knowledge, impressive stray dog control methods and dog vaccination programs.

Conflict of interest statement

The authors declare that there are no conflicts of interest.

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Comments

Background

Animal bite is one of the most important health problems in certain countries of the globe with an guesstimated 2% of the people bitten every year. Dog bite makes up 80–85% of all reported cases. More than 90% of animal rabies cases occur in wild animals. Rabies is endemic in most counties of Iran. In this regard, the present study was done on epidemiology animal bites in Islamabad-Gharb County, Western Iran (2004–2008).

Research frontiers

To investigate the prevalence and epidemiology of animal bites in Islamabad County, Western Iran, during 2004–2008.

Related reports

In the present study, dogs were responsible for 96.7% cases of animal bites which was consistent with the results obtained from other studies (Matter 2000, Majidpour 2004). In the studies of Zeynali 1999 and Majidpour 2004 the most bites were in the age group of 10–29 years old which is in agreement with this research.

Innovations & breakthroughs

In this study, the mean incidence rate of animal biting was determined 2.6 per 1 000 people. Furthermore, animal bites were common among the age group of 10–29 years. The most cases had been wounded on their legs.

Applications

It is significant to recognize the epidemiology and demography of animal biting in each region. This will help us for designing and proposal of preventive measures.

Peer review

It is a good research which the authors studied the prevalence and epidemiology of bites in Western Iran. The findings are attractive and indicated that animal bites were frequently by dogs, in summer, males and age group of 10–19 years old.

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