

Brief Report

Epidemiological survey of animal bites in east of Iran

Bitā Bijari^{*1}, Gholam Reza Sharifzade², Ali Abbasi³, Solyman Salehi⁴

Abstract

Objectives: Animal bite is an important public health problem. In Iran, surveillance system carries out primary prevention for total animal bite cases in order to prevention of rabies. This study is carried out to investigate animal bite epidemiology in Birjand from 2002 to 2009.

Patients and Methods: Standardized investigation form is used to record data from Birjand health center regarding demographic data of individuals, exposure status, treatment and biting animals between 2002 and 2009.

Results: The mostly affected individuals were in age group of 20-29 (23.9%), males (78.3%) and in rural residents (64.2%). Moreover, 86.3% were bitten by domestic animals and most cases were bitten by dog (80.3 %). Incidence rate of animal bites in Birjand was increased from 54.36 to 86.74 in 100 000 from 2002 to 2009.

Conclusion: This study indicated that rabies surveillance in Birjand should focus on education to individuals, domestic animal vaccination and eradication of stray dogs.

Keywords: animal bite, rabies, epidemiology, Birjand.

Introduction

Annually, 140 cases of animal bite per 100 000 population are estimated to occur in Iran, more than 85% of which are dog bites (1). In fact, animal bites are one of the most important public health problems in some countries of the world with an estimated 2% of the population bitten each year. At risk population are young children and men who can be bitten especially by certain dog breeds and unrestrained dogs (2).

Animal bite is not only accounted for the associated risk of acquiring secondary infections and occasional death due to trauma but also for the possibility of contracting rabies which, if left untreated, is almost always deadly (3). Every year, more than 15 million people worldwide receive a post-exposure regimen to prevent its lethal phase to come about that is estimated to circumvent 327

000 rabies deaths annually. Although all age groups are susceptible, on average 40 % of post-exposure prophylaxis regimens are given to boys aged 5–14 years (4,5).

The first step in preventing this kind of accidents is to identify the associated risk factors. In Iran regarding to high mortality and high cost, surveillance system carries out primary prevention for total animal bite cases in order to prevention of rabies.

Birjand in Southern Khorasan province in the east of the country has many rural areas and a population of around 270 000. Epidemiological survey of animal bites has not been performed in Birjand up to now and therefore, there is not adequate data in this area.

Aim of this study was to determine the incidence of animal bite, describe the characteristics of patients reporting animal bite, characteristics of the biting animals, wounds status and applied treatment in animal bite cases in Birjand that can be helpful in preventive attempts.

Patients and methods

This retrospective study is accomplished upon the whole cases of animal bite from April 2002 to April 2009 registered in the health center of Birjand University of Medical Sciences.

The data gathered from the data bank of the university and recorded to investigation forms. In this respect for all cases, the standardized investigation form designed by the diseases management center was used and demographic data, exposure status and treatment, biting animals and wound conditions were recorded and analyzed by descriptive statistics and chi-square test. The significance level was set at $p < 0.05$.

1- Community Medicine Specialist, Department of Community Medicine, Birjand University of Medical Sciences, Birjand, Iran

2- Master of Epidemiology, Department of Community Medicine, Birjand University of Medical Sciences, Birjand, Iran

3- Bachelors in Health, Department of Health, Birjand University of Medical Sciences, Birjand, Iran

4- Bachelors in Health, Health Center, Birjand University of Medical Sciences, Birjand, Iran

Corresponding Author: Bitā Bijari, MD, Department of Community Medicine, School of Medicine, Birjand University of Medical Sciences, Ghafari St., Birjand, Iran

Tel: +98 561 4445210

Fax: +98 561 4433004

Email: bita.bijari@yahoo.com

Received for Publication: November 24, 2010

Revision Received: February 12, 2011

Revision Accepted: March 1, 2011

Results

The study has been performed on 1662 cases with mean age of 33.4 ± 19.5 years (range from 1 and 90 years) of which 78.2% were male and 21.8% were female ($p=0.0001$). Furthermore, 64.2% and 35.8% were living in rural and urban areas, respectively ($p=0.0001$). The majority of bites were related to summer and spring seasons ($p=0.103$) and due to the occupation except that of in relation to students and agricultural careers ($p=0.0001$). Moreover, 96.1% of cases were vaccinated within the first 24 hours, 81.9% had incomplete while 18.1% had complete vaccination ($p=0.0001$). No cases of rabies were observed (table 1).

Bite cases by domestic animals were 86.3% and the majority was done by dogs (80%). In 85.1% of cases the animal has been under special care, 12.2% of the animals escaped and 2.8% were killed (table 2). Most patients belong to 20-29 age group (fig.1) and 43.9% of patients were attacked and injured with one wound, 32.4% with two and the rest was wounded in three or more sites. The average number of wounds was 2.0 ± 1.3 wounds (range 1-10 wounds) while 72.3% of cases were injured with deep and 27.7% with shallow wound(s). Related to frequency distribution type of the animal as biter and residency of bitten persons from 2002 to 2009 there have been observed significant difference in different years (P value=0.001 and P value=0.006 respectively). However, related to frequency distribution of sex and age average of those been bitten by the animal from 2002 to 2009 there have not been observed significant difference (P value=0.176 and P value=0.033 respectively).

The highest and lowest number of bitten individuals were in 2004 and 2002, respectively (fig.2). Prevalence of animal bites in Birjand altered from 54.36 in 100 000 in 2002 to 86.74 in 100 000 in 2009 and the highest prevalence belong to 2005 (101.89 in 100 000).

Discussion

Rabies is a fatal disease which is widespread in several districts of the world. In Iran, it is to be assumed as a major priority and surveillance system carries out primary prevention for total animal bite cases in order to prevent rabies.

The incidence of animal bites in different parts of the Islamic Republic of Iran has increased from 35.1 per 100 000 in 1987 to 151 per 100 000 in 2001 (6,7).

Incidence rate of animal bites in Birjand was increased from 2002 to 2005 and afterwards nearly constant to 2009. Meanwhile, in a retrospective study related to Gilan, Golestan and Mazandaran provinces to assess epidemiological situation of human and animal rabies and bitten humans during 1996-2007 downward trend in incidence of animal rabies was obvious (8). Increase in the incidence of animal bites in Birjand might be due to improvements in reporting system or increased number of stray dogs in rural areas.

According to results of this study, 78.2% of those who were bitten by animals were male and 21.8% were female, which is similar to the other Iranian studies (1,9). For instance, based on a study performed between 1994 and 2003 in Kerman province, 73.48% of those who were bitten by animals were male and 26.52% were female (10)

and in Tehran, 79.16% were males (11). It seems that the higher incidence of bites in males is due to their activities in open areas.

Table1: Distribution of variables in animal bites cases during 2002- 2009 in Birjand

P- value	percent	frequency	variable	variable
0.0001	21.8	362	female	sex
	78.2	1300	male	
0.0001	12.8	213	worker	occupation
	8.1	134	clerk	
	15	249	farmer	
	7.5	124	breeder	
	15.6	259	student	
	41	682	Others	
0.0001	35.8	595	urban	residency
	64.2	1067	rural	
0.103	26.4	439	spring	seasons
	26.5	441	summer	
	23	382	autumn	
	24.1	400	winter	
0.0001	18.1	301	complete	applied treatment
	81.9	1361	uncompleted	

Table2: Distribution of biting animals Birjand: 2002- 2009

variable	variable	Frequency(percent)
biting animals	domestic	1435(86.3%)
	wild	73(4.4)
	stray	154(9.3)
approach adopted to biting animals	observation	1414(85%)
	escaped	202(12.2%)
	killed	46(2.8%)

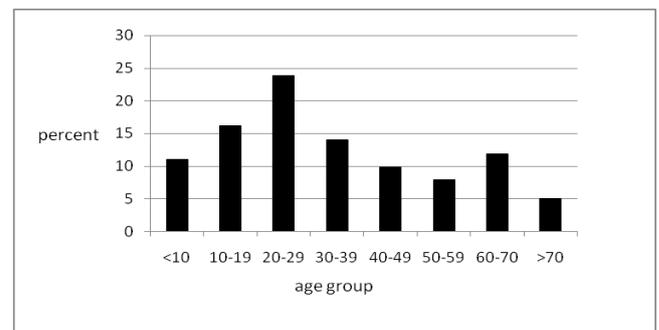


Figure1: Age distribution of the cases during 2002-2009

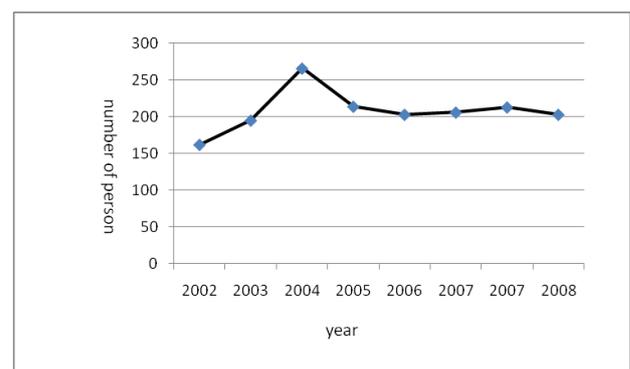


Figure2: Trend of animal bite frequency during (2002-2009)

In the surveys performed in Ilam and Kerman provinces, the majority of bitten persons were from rural areas which is similar to our findings as well (10,12).

In an Indian national multi-centric rabies survey in 2003, the annual incidence of animal bites was more in rural areas (1.8%), children (2.6%) and poor/low income group (75%) (13). Moreover, the Iranian nationwide rate of the bites in 2005 was 65% due to rural and 35% occurred urban districts. Overall results of our study were compatible with WHO reports and results of other Iranian studies, which indicated rabies as a disease of poverty affecting very vulnerable often remote/isolated rural populations (5).

Additionally, we found 20-29 and 10-19 year-old individuals as the most affected age groups which is compatible with other Iranian studies in Tehran, Yazd and Western Azerbaijan (11,14,15) and with that of WHO where rabies was named as a disease of the youth (2,5).

Considering the occupation, the study indicated them in turn as farmer, worker, student and breeder as high chances toward the disease. According to a study about animal bites and rabies in Iran, most cases were farmers and housewives from 1996 to 1997 (3).

Besides, most of the people were bitten during summer and spring that can be due to increased activities in both human and animals in these time periods which was, however, not significant.

Apart from that, 80% of our cases were victims of dog bites while 86.3% were of domestic animals which is similar to other national studies (16-19). Meanwhile, 43.9% of patients had one wound. In a survey on animal bite in children of less than 16 years of age in Bushehr; 2001-2006, 65% of them had one wound as well (17). Besides, complete rabies prophylaxis regimes were administered in 18.1% of cases while 81.9% received incomplete vaccination. In Kerman survey on bitten patients of 1994-2003 time period, complete and incomplete rabies vaccination was performed in 79.36% and 20.64% of cases, respectively (10).

Rabies is a fatal but vaccine-preventable disease (in both humans and animals) of which occurrence of symptoms is equal to death. For this reason, the main principle toward prevention of rabies should be on time usage of the essential vaccine and serum while it can be effective as used only within 12 hours after bite of a rabid animal.

In conclusion, the findings of this study showed that animal bites remain a very important problem in Birjand town and eradication of stray dogs and vaccination of domestic ones as well as educational programs should be well organized by health authorities.

Acknowledgement

The authors are grateful to staff of the health center of Birjand University of Medical Sciences for their assistance with data collection.

Conflict of interest

None declared

References

1. Alavi SM, Alavi I. Epidemiology of animal bites and stings in Khuzestan, Iran, 1997-2006; *J Infect Public Health*, 2008; 1(1):51-5.
2. Dendle C, Looke D. Animal bites: an update for management with a focus on infections; *Emerg Med Australas*. 2008; 20(6):458-67.
3. Zeynali M, Fayaz A, Nadim A. Animal bites and rabies: situation in Iran. *Arch Iran Med*. 1999; 2: 120 -4.
4. WHO expert consultation on rabies. First report. Geneva, World Health Organization, 2005:13-5.
5. WHO, Strategies for the control and elimination of rabies in Asia. Report of a WHO interregional consultation Geneva, Switzerland. 2001: 1-19
6. Sheikholeslami N.Z., Rezaeian M. , Salem z. Epidemiology of animal bites in Rafsanjan, southeast of Islamic Republic of Iran, 2003-05; *Eastern Mediterranean Health Journal*. 2009; 15(2):455-7.
7. Akbari M. The epidemiologic study of animal bites in Iran. Tehran, Islamic Republic of Iran, Ministry of Health and Ministry of Medical Education. 2001; 34-5.
8. Bokaie S., Fayaz A., Pourmahdi, Boroujeni M., Haghdoost A.A., Zou Alfaghahari M.R., et al. Epidemiological study of rabies and animal bites in Caspian sea littoral provinces ; scientific-research Iranian veterinary journal. 2009; 4:5-14.
9. Amiri M., Khosravi A. Animal Bites Epidemiology in Shahrood city; knowledge and health .2009; 4:41-3.
10. Rezaeinasab, M., Rad I, Bahonar A. R., Rashidi, H., Fayaz, A., Simani, S., Haghdoost, A. et al. The prevalence of rabies and animal bites during 1994 to 2003 in Kerman province, southeast of Iran; *Iranian Journal of Veterinary Research, University of Shiraz*. 2007; 8:343-50.
11. Eslamifard A, Ramezani A, Razzaghi-Abyaneh M, Fallahian V, Mashayekhi P, Hazrati M, et al. Animal bites in Tehran, Iran; *Arch Iran Med*. 2008; 11(2):200-2.
12. Bahonar AR, Bokaie S, Khodaveirdi KH, Nikbakht Boroujeni GH, Rad MA. A Study of Rabies and the Frequency of Animal Bites in the Province of Ilam, 1994-2004; *Iranian Journal of Epidemiology* .2008; 4: 47-51.
13. Sudarshan MK, Mahendra BJ, Madhusudana SN, Ashwoath Narayana DH, Rahman A, Rao NS et al. An epidemiological study of animal bites in India: results of a WHO sponsored national multi-centric rabies survey; *J Commun Dis*. 2006; 38(1):32-9.
14. Hoboobati MM, Dehghani MH, Sarvat F. Ten years record of animal bite cases of patients referred to Nikoopour health center, Yazd, 1369-78 ; *Journal of shahid sadoughi university of medical science and health services*. 2002; 9: 120-17.
15. Sadeghi A, Shariat Zadeh MR, Nejad Rahim R. Study of incidence of animal bites in west Azarbaijan province of Iran in 1999; *urmia medical journal*. 2003; 14: 45-4.
16. Fayaz A., Simani S., Janani A.R, Farahtaj F., Esfandyar B i, Eslami N., et al. Epidemiological Survey of Rabies in Mazandaran Province during 1996-2006; *Journal of Babol University of Medical Sciences*. 2009; 11: 70-5.
17. Hatami G , Motamed N., sheikh eslami N. A survey on animal bite in children less than 16 years old in Bushehr; 2001-2006 ; *Iranian South Medical Journal* .2007; 9: 182-9.
18. Dadypour M., Salahi S., Ghezelsoufa F. Epidemiological survey of animal bites in Kalaleh district, North of Iran (2003-05); *Journal of Gorgan University of Medical Sciences* ,2009; 11: 76-9.
19. Majidpour A, Arshi S, Sadeghi H, Shamshirgaran SM, Habibzadeh S. Animal Bites: Epidemiological Considerations in Ardabil Province, 2000; *Journal of Ardabil university of medical science and health services*. 2004 ; 3: 39-43.