Animal Bite and its Contributors in Aq-Qala District, Golestan Province, Iran

Narges Rafiei[1], Hashem Heshmati[2*], Abdolmajid Taneh[1]

1. Aq-Qala Health Center, Golestan University of Medical Sciences, Gorgan, Iran
2. Department of Public Health, School of Health, Torbat Heydariyeh University of Medical Sciences, Torbat Heydariyeh, Iran

[*] **Corresponding author:** Tel: +98 913 4512051; fax: +98 5152228021
Address: Department of Public Health, School of Health, Torbat Heydariyeh University of Medical Science, Torbat Heydariyeh, Iran
E-mail: heshmatih1@thums.ac.ir
Received 6/12/2013; revised 21/1/2014; accepted 10/6/2014

Abstract

Introduction: Rabies is one of the most important infectious diseases and animal bites are increasing in Iran. Due to the significance of the subject, the current study was designed and conducted with the aim of determining Animal bite status and its contributors in Aq-Qala district, Golestan province, Iran.
Materials and methods: This is a data-based study with descriptive approach carried out in Aq-Qala from Feb/March 2010 to Feb/March 2011. 1025 cases of animal bites registered in rabies treatment center of Aq-Qala city were selected using census method. Data were collected using a reliable and valid Checklist. Data were entered into SPSS18 software and analyzed through descriptive statistics.
Results: 74.7% of studied cases were male. Their mean age was 25.7±17.8 years. Most bites occurred among adolescents and students (21.6%). Most bites occurred on foot and mainly in rural areas (81.5%). 40 %of bites occurred from 12 a.m. to 6 p.m. Most cases of animal bite were by dogs (94.4%). The injuries were superficial in 90.1% of cases. The animal bites occurred in 78.2% of cases on clothes. Most bites occurred in spring, in June. The incidence rate of animal bites was 854 cases per 100000 people.
Conclusion: Due to the high prevalence of animal bites in males, adolescent, students, rural areas and in spring, we recommended appropriate intervention, especially educational intervention in men, adolescent, students, rural area and in spring to decrease the prevalence of animal bites.

Keywords: Animal bites, incidence, Aq-Qala

Introduction

Rabies is a fatal zoonotic viral disease that exists in all continents and is endemic in most African and Asian countries. The disease is transmitted to humans through contact (mainly bites and scratches) with infected animals. An estimated 55000 deaths occur per year worldwide as a result of Rabies, 56% of which occurs in Asia, particularly in rural areas. In Africa and Asia, these deaths are responsible for 1.74 million disability-adjusted life years (DALYs).The annual cost of rabies is estimated to be US$ 583.5 million and most of this cost is for Asian countries because of large amounts of post exposure prophylaxis measures (1). According to World Health Organization reports, more than 90% of human rabies cases are transmitted by dogs (2).

Animal bites are increasing in Iran, so that the incidence of animal bites has increased from 35.1 per 100000 in 1987 to 151 per

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100000 in 2002 (3). Increasing animal bites cases enhances cost of purchasing human rabies anti-serum, human vaccine (4).

Rabies should be considered as a notifiable disease within national health and veterinary systems and epidemiological data should be collected, processed, analyzed and disseminated rapidly between sectors and different administrative levels. As mentioned above, an important step in rabies management & prevention would be situational analysis and reliable assessment of annual human and animal rabies deaths, animal bites, geographical distribution and other epidemiological information and data (5).

Rabies is endemic in wildlife of Iran; therefore, infection of domestic animals is occurring repeatedly (6). Golestan province occupies the first rank in animal bites in Iran (7) and Aq-Qala city has the first rank in Iran (8). So, this study was done to determine animal bite status and its contributors in Aq-Qala district, Golestan province, Iran.

Materials and methods

This is a data-based study with descriptive approach conducted in Aq-Qala from Feb/March 2010 to Feb/March 2011. 1025 cases of animal bites registered in rabies treatment center of Aq-Qala city were selected using census method. Data were collected using a reliable and valid checklist through information of individuals' registered office profile of the above center. Cases referring from other cities were excluded from the study. The checklist included the following variables: age, gender, occupation, location, location of bite, time of bite, animal type, bite site, injury status, number of injuries, time and doses of vaccine and serum injection, animal status, vaccination status, season of bite and month of bite. Data were analyzed through descriptive statistics in SPSS software. Animal bite incidence was calculated as the number of bitten cases per 100,000 populations at-risk.

Results

1025 cases of animal bites was registered in Aq-Qala district during the study year and the incidence rate of animal bites were 854 cases per 100000 people. Our finding showed that 766(74.7%) and 259 (25.3%) of under studied people were male and female, respectively. The mean age of bitten was 25.7±17.8 (1.5-87) years old. Most bites occurred among adolescents10-19 years (25%) and students (21.6%) (Table1).

968 (94.4%) cases of animal bite were by dogs, 36 (3.5%) by cat, 13(1.3%) by cow and 8(0.8%) cases were by other animals. 948(97.9%) of dog bites were by domestic dogs.

Most cases of animal bite occurred in legs (74.8%) and in hand (16.5%). The rabies suspected exposure was observed in %1.5 of the cases of human animal bites and all suspected animals were cows (Table1).

835 (81.5%) cases of animal bites occurred in rural area and 190 (18.5%) cases of them occurred in urban area.

Our findings showed that %40 of bites occurred from 12 a.m. to 6 p.m., 29% from 6 to 12 p.m., 25.4% from 6 to 12 a.m. and 3.2% occurred from 0 to 6 a.m.

Regarding animal status, %93 of animals were alive 10 days after biting and in other cases their consequence was death or unknown. The highest frequencies of injuries were seven injuries per persons that occurred in two people and there were one injury in 44.9% of cases. The injuries were superficial in 90.1% of cases. 78.2% of occurring animal bites were covered over by clothes. Vaccination of 93.6% of the cases was incomplete and 1.9% of the cases were vaccinated in the past. 15.8% of those who received the vaccine, as well as Rabies Serum.

Animal bite cases were reported throughout the year with more bite incidents during the spring (315/1025; 30.7%) followed by winter (258/1025; 25.2%) and summer (236/1025; 23%). The reported incidents were lowest during the

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autumn (216/1025; 21.1%). Also, most bites occurred in spring and in June.

Table 1. Frequency distribution of animal bites.

Bite location	Foot	Hand	Head, Face and Neck	Trunk	More than one Organ	Contact with suspected animal	Unknown	
Number (%)	767(74.8)	169(16.5)	40(3.9)	21(2.0)	8(0.8)	15(1.5)	5(0.5)	
Age Groups (years)	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70>
Number (%)	199(19.4)	256(25.0)	220(21.5)	130(12.7)	84(8.2)	63(6.1)	48(4.7)	25(2.4)
Job	Student	Children	Housewife	Worker	University Student	Employee	Farmer	Other
Number (%)	221(21.6)	134(13.1)	181(17.7)	92(0.9)	11(1.1)	26(2.5)	144(14)	216(21)

Discussion

Rabies is one the most important zoonotic diseases that is endemic in Iran(6). Our findings showed that incidence rate of animal bite was 854 per 100000 in Aq-Qala compared to 472 per 100000 in 2010 Golestan province (8) that represents animal bite incidence rate in Aq-Qala is 2 times more than the whole province incidence rate which is consistent with the study done in Caspian Sea littoral provinces (7).However, compared to 2000-2009 period, the incidence rate of animal bites was 1122 per 100000 in Aq-Qala (9). In comparison with the current study, we see a decrease in animal bites incidence due to appropriate interventions such as educational programs for using dog collar and also killing stray dogs. Despite incidence decreases in Aq-Qala, it is still the first rank in animal bites in Golestan province which requires necessitations of appropriate interventions, especially educational ones. Incidence rate of animal bites was 256 in Shahroud city (10), 774 in Kalaleh city during 2003 to 2004(4), 39.6 in Uganda (11) and 1700 per 100000 in India (12) that represents the highest rate in the studied area. Unfortunately, there is no cure or effective treatment for rabies and death occurs once the rabies symptoms begin. Therefore, educational programs and appropriate interventions for dog's collar using should be continued and appreciated (3).

ehT mean age of studied people (cases of animal bites) was 25.7±17.7 that is consistent with other studies in Aq-Qala (9) and Kalaleh cities(4). The age range of under studied people was between 1.5 to 87 years old that is consistent with other studies in Iran (10,4). Most bites occurred among adolescents aged 10-19 that is consistent with other studies in Mashhad(13), Ilam(6) and Yazd cities (14) but in contrast with other studies (15,16). In a study in Uganda, 40% of animal bites occurred in children under 10 years old (11) and in Trinidad Twenty-eight percent of children were bitten at least once by a dog (17).

Our finding showed that most animal bites victims were men that is consistent with other studies in Iran(4,6,9,10,13,14,15) and other countries such as Bhutan (16), Trinidad (17), Turkey (18) and India (19). Gender (male) is a risk factor for bites

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(17), probably due to working out and in farms.

Most cases of animal bites were by dogs that is consistent with other studies in Iran (9,13,15) and other countries and districts such as India (12,16,19), Uganda (11), Turkey (18), Thailand (20) Pennsylvania (21) and Bangkok (22). It can be due to the high numbers of dogs and their special characteristics (biting).

In our study, the victims were predominantly bitten by owned dogs that are consistent with a study in Turkey (18). Another study reported that the incidence of dog and other animals' bites were mostly determined by population densities (numbers in studied area) of dogs and other animals and people and other sociocultural factors (12). In contrast to our findings, the majority of victims were bitten by stray dogs in Thiland, Bhutan and India(12,16,20). Moreover, despite interventional programs (removal of stray dogs) for decreasing animal bites in Aq-Qala district, there was not a decrease in bites incidence and bites incidence is still high (23).Subjects reported that interventional program (removal of stray dogs) was not significantly effective (24).In O'Sullivan study, more than 70% of dog bites occurred when the dog wasn't in its owner control (25). According to World Health Organization's report, there is no evidence that removal of dogs alone has ever had a significant impact on dog population densities or the spread of rabies. In addition, dog removal may be unacceptable to local communities. However, the targeted and humane removal of unvaccinated, ownerless dogs may be effective when used as a supplementary measure to mass vaccination (5). The study that was done in Taiwan suggested that low rates of neutering, easy availability of low- or no-cost puppies, a tendency to allow owned dogs free access to the outdoors, unrealistic expectations of dog ownership, canine behavioral problems, and religious and cultural taboos against euthanasia and shelter relinquishment have contributed to the recent increase in the number of free-roaming dogs in Taiwan (26). Multilateral intervention such as prohibiting dogs to roam freely in the neighborhood and Government legislations was suggested (26-29).

Like previous studies (4, 6, 9, 14-16), our data also showed that most bites occurred among students. Students play with dogs in their free time that is one of the most important causes of animal bites, so providing leisure centers is necessary for preventing contact with dogs. A study revealed that increased dog bite incidents in children can be considered as a behavioral risk because of their extreme curiosity, lack of inhibition, limited knowledge and experience about dog behavior, and inability to protect themselves from an attack (16). Another study showed that less shy children took greater risks with the dog and children's behavior with unfamiliar dogs may parallel behavior with other novel or uncertain situations (30).

Most bites occurred in rural area which is in line with findings of other studies (4, 6, 9, 10, 31), but it is in contrast with studies in Mashhad (13) and Bushehr cities (32). It seems that most families in rural area have a dog and their dogs do not have dog collar, thus leading to bites increase in this area.

Most bites occurred between 12 a.m. to 6 p.m. Another study in Trinidad showed that most bites occurred in the afternoon (17) and in Bangkok the time of the attack was mostly during the day (22).

Since students and rural area had the highest animal bite incidence as well as being school time in the morning, we can conclude that bites in students occurred in free time and different interventions such as educational intervention are necessary. A study showed that children who had been educated on ways to approach dogs, displayed greater precautionary behaviors than children that did not receive any education in this subject (33). Another

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study showed that children's behavior with unfamiliar dogs may parallel behavior with other novel or uncertain situations and implications for intervention programs include targeting at-risk children and merging child and parent-oriented interventions with existing programs toward the physical environment and the dog (30).

In line with other studies (4, 6, 9, 11, 15, 17, 22), most bites occurred in foot but in Mashhad (13) and Yazd cities(14) most of the bites occurred in hand.

93% of animals were alive 10 days after bites that is consistent with a study in Shahrood city (10). In the present study, low percent of animals were dead or unknown but in Uganda 21% were reported as still alive, 34% were dead and 45% were unknown(11) and in india 60.8% of dogs were alive after biting(12). The high percent of living animals (10 days after biting) in our study showed that most bites were the result of improvident behaviors with dogs. Based on world Health organizations' reports, it is generally recommended that the biting animal be isolated and observed for 10 days to determine whether the animal has rabies or not (3,5).

In the present study, vaccination of 93.6% of the cases was incomplete, because 93% of animals were alive, 10 days after biting. Every year millions of people all over the world receive a post-exposure vaccination for preventing the rabies to prevent hundreds of thousands of rabies deaths annually (2).

The injuries were superficial in 90.1% of the cases that is consistent with other studies in Mashhad (13) and Kalaleh cities (4).Our data also showed that animal bites occurred on clothes in 78.2% of cases as shown by earlier studies (9,10).

Our findings also showed that bites occurred all over the year. However, the majority of bites occurred in spring and in June that is consistent with other studies in Ilam(6), Kalaleh (4), Aq-Qala (9) but studies in Ardabil (15) and Shahrood cities (10) showed equalities in all seasons. In the Thailand study, prevalence of dog bites showed no seasonal variation in adults but there were two peaks during school vacation period for children (20). Based on different models of animal bite in various cities and districts, we recommended preventive strategies directed toward the public, pet owners, and all animals' incidence rate status in each city.

The present study presented valuable information on animal bites and at-risk population. Results revealed that the majority of bites occurred by owned dogs. One of the most important public health problems of Aq-Qala district is free roaming owned dogs which require interventional programs such as intersectional coordination and cooperation between health centers and other organizations to prevent owned dogs' free access to outdoors.

The main limitation of the current study was data collecting from the files register in health department. So, despite including all data, it can be assumed as a good sample not census.

Conclusion

Prevalence of animal bites is higher in men, adolescents, students, rural area and in spring season. Thus, appropriate educational interventions are recommended to diminish animal bites' rate.

Acknowledgments

We gratefully acknowledge the health staff in rabies treatment center, especially Mr Salehnia and Mr Shirmohammadli for their valuable cooperation during the study. Also, we would like to thank the management of Aq-Qala Health Center for his collaboration.

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