Original Research Article

Epidemiology of Animal Bite Injuries in Golestan Province, Northeast of Iran, during 2011-12

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ABSTRACT

Introduction: Animal bite is a public health problem worldwide. The aim of this study was to investigate frequency of animal bites in Golestan province, northeast of Iran, between 2011 and 2012. **Methods:** This descriptive cross-sectional study was done by collecting data from medical records of animal bite victims referred to the health centers in the Golestan province, in 2011-12. Information collected included species of animals, gender, age, occupation, location of residence, type of treatment, and type of injury. The data were analyzed by SPSS (version 16). **Results:** Overall, there were 10,810 incidents of animal bites in the province in 2011-12. Of these cases, 8125 (75.48%) were men and most cases were 5-24 years of age. Dog bites accounted for 9885 (91.44%) cases of animal bites. Most incidents occurred in rural areas (82.27%). Most vulnerable individuals were students (n=2370, 21.92%) and homemakers (n=1722, 15.93%). The most common site of animal bites was lower limb (62.53%). Moreover, treatment with anti-rabies serum and vaccine was done for 9610 (89.9%) and 9068 (83.89%) cases, respectively. **Conclusions:** According to our results, animal bites are more frequent in young men, residents of rural areas, and students. In addition, dog bites account for 91% of all cases of animal bites in the province. These results highlight the need for education programs on animal bites and rabies to increase knowledge and awareness of the individuals at risk.

KEYWORDS: Animal bite, Rabies, Epidemiology

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INTRODUCTION

Animal bite is a major threat to human health. Rabies is a viral disease that spreads through animal bite, and could result in mortality. It is one of the leading causes of death, particularly in developing countries [1-3]. The disease is of great importance because of its high incidence and mortality rate, which imposes high economic costs [4-6]. The disease is usually transmitted through the saliva of a rabid animal after biting, but it can also spread via licking on wound or on mucosa, clawing, scratching, inhalation of infected air and transplantation of organs particularly cornea [7-8]. After manifestation of clinical symptoms in humans or animals, the disease cannot be treated, and usually leads to death [9-11]. Millions of people receive the vaccine against rabies every year. Rabies is endemic among the wildlife of Iran and domestic animals infected. Furthermore, the virus cannot be entirely controlled in domestic and wild animals [12-15].

The virus transmits to humans mainly through dog bites [1,16,17]. According to the World Health Organization, more than 2.5 billion people live in regions where rabies is endemic [19,21]. Furthermore, 10 million people in different regions undergo post-exposure treatment annually, and 40-70 thousand people die of rabies in the endemic countries. In addition, 30-60% of all incidents of human rabies occur in children below 15 years of age. However, due to the lack of an advanced healthcare system, the actual incidence rates could be even higher [22-28]. Dog rabies is epidemic in several developing countries, and accounts for more than 90% of all cases of animal rabies [29]. According to report of Center for Disease Control, the frequency

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of animal bites in Iran is 173.2 per 100,000 [14]. Since animal bites are more common among young boys and men, almost 40% of preventive treatments are carried out on males aged 5-14 years [30]. The increasing number of stray dogs and animal bite cases shows the importance of the disease and the need for taking necessary measures [8]. The first step in disease control is epidemiology surveillance [2,9]. Therefore, this study was done to investigate the prevalence of animal bites and incidence of rabies in Golestan province, Iran.

MATERIALS AND METHODS

This descriptive cross-sectional study was conducted on animal bite victims referred to healthcare centers of the Golestan province between 2011 and 2012. Data were obtained by collecting medical records of animal bite cases. The records contained information on the victim's gender, age, occupation, treatment, type of injury, and species of the biting animal. The data were analyzed by SPSS (version 16).

RESULTS

Overall, we analyzed 10,810 cases of animal bites. The prevalence rate of animal bites in the province was 6.27 per 1000 person. Majority of the cases were men (75.48%). Mean age ± standard deviation (SD) of the individuals affected was 27.76 ± 18.34 years. The frequency of animal bites was highest among individuals aged 5-14 years (Figure 1).

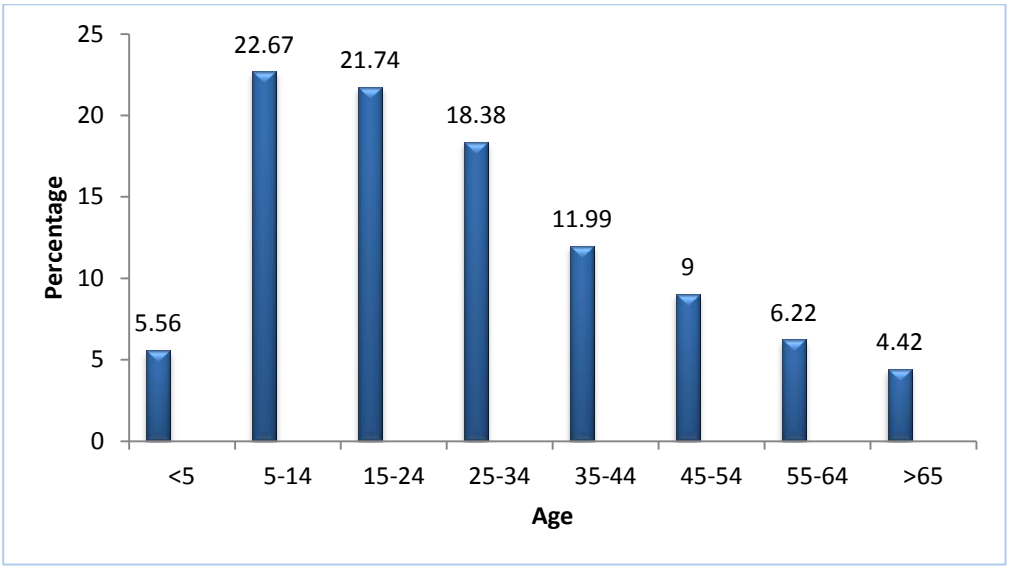

Figure 1. Frequency distribution of animal bites among different age groups in the Golestan province

Frequency of animal bites was highest in students and homemakers and lowest in veterinary physicians (Figure 2).

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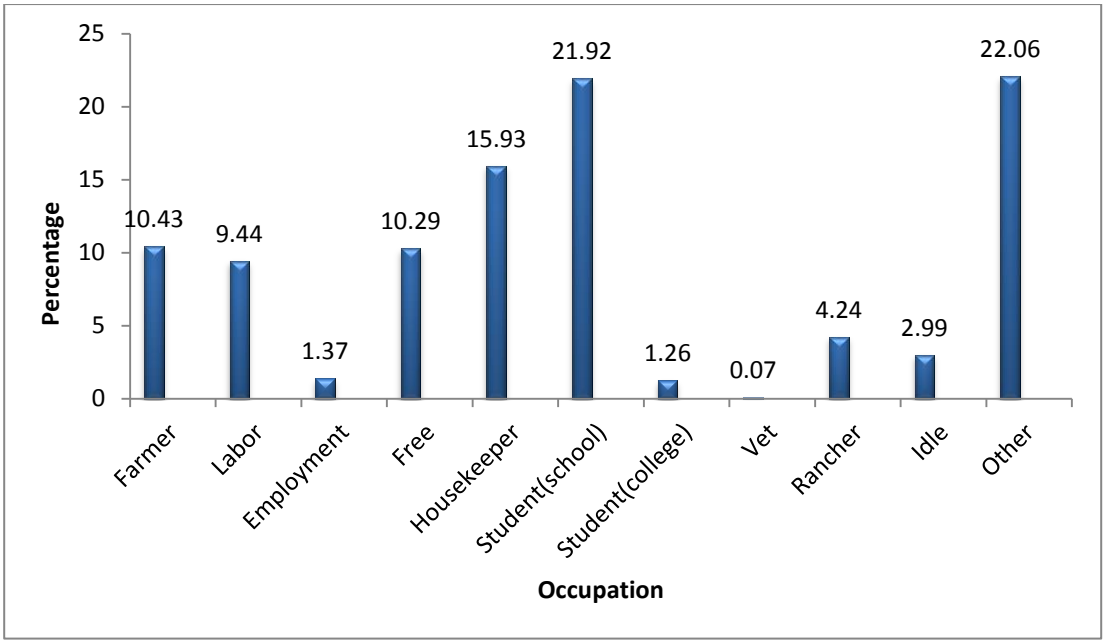

Figure 2. Frequency distribution of animal bites according to occupation of the individuals affected in the Golestan province

We found that 8792 (82.25%) of the cases were from rural areas. In addition, 91% of all cases were related to dog bite (Table 1).

Table 1. Frequency of bites in Golestan province based on the animals responsible

Animal	Number	Frequency (%)
Dog	9885	91.44
Cat	508	4.70
Cattle	31	0.29
Horse	28	0.26
Sheep	36	0.33
Donkey	44	0.41
Other	278	2.57

The most common part of body affected in injuries was lower limb (62.3%), followed by upper limb, trunk, head, face, and neck (Table 2).

Table 2. Frequency distribution of animal bites based on the biting site

Biting sites	Number	Frequency (%)
Upper limb	2682	25.25
Lower limb	6612	62.3
Trunk	1054	9.93
Head, face and neck	267	2.51

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In our study, 89.9% (9610) and 83.89% (9086) of the victims were treated with anti-rabies serum and vaccine, respectively. In addition, 87.93% and 12.07% of the cases received three and five doses of vaccine, respectively.

DISCUSSION

We investigated the frequency of animal bite cases in the Golestan province during 2011 and 2012. Our results showed that animal bites were more frequent in men, residents of rural areas, students and homemakers. In addition, most animal bites occurred in individuals aged 5-14 years. Similar to our study, several other studies have shown that men are more frequently affected than women [31-38]. This could be because men spend more time outside the house, and are therefore at higher risk of contact with animals.

In the present study, the highest rate of animal bite was observed in individuals aged 5-14 years. In a study in India, about 50% of animal bite cases were below 25 years of age, which is in agreement with our study [39]. In study of Bahonar and Amiri, majority of cases belonged to the 10-29 and 17-30 age groups [40,41]. This could be because individuals in these age groups have more risky behaviors such as playing with animals or teasing animals, which increases the risk of being bitten.

Our findings showed that majority (82.27%) of animal bite cases occurred in rural areas, which is similar to results of several other studies in Iran [30, 33, 40, 41]. This could be related to factors such as higher population of stray animals, lack of wall and fences around houses, and keeping guard dogs in rural area. In this study, dog bites accounted for 91% of all cases of animal bites in the province. Most cases were children, young people, and homemakers. Domestic dogs caused most of the dog bites. This indicates the lack of appropriate knowledge or skill on petting animals. Thus, necessary information or trainings should be provided for individuals willing to pet animals. Moreover, leashing dogs during daytime could help reduce the rate of dog bites.

We found that the most vulnerable individuals were students (21.92%) and homemakers (15.93%). Several studies in Iran also showed that students are the most vulnerable population for animal bite [31, 33, 40, 41].

The most common site of animal bites was lower limb (62.53%). This finding is consistent with results of some other studies [31, 40, 43]. It seems that running away from the animal is the main cause of animal bite in lower limb, but provoking the animal or playing with the animal could also lead to upper limb upper extremity injuries.

In our study, 89.9% of cases received anti-rabies serum and 83.89% of the bite victims received vaccine. In a study by Rezaeinasab in Kerman province, 79.36% and 20.64% of the cases received complete and incomplete vaccination, respectively [31]. In our study, 90.89% of injuries were superficial, which is similar to results of two other studies [40,44].

CONCLUSION

According to our results, animal bites are more frequent in young men, residents of rural areas, and students. In addition, dog bites account for 91% of all cases of animal bites in the province. These results highlight the need for education programs on animal bites and rabies to increase knowledge and awareness of the individuals at risk.

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