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## Brief Report

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### Animal Bites in Tehran, Iran

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Animal bites are major public health issues, not only for the risk of acquiring secondary infections but also for the possibility of contracting rabies. The objective of this study was to determine the epidemiology of animal bites in Tehran, Iran. During a three- year period, through a questionnaire- based study, 8806 bitten persons were enrolled into our study. Of these, 79.16% were males and 20.84% were females. Bites were most frequent among the age group of 20-29 years. Most cases were self employed. Upper extremities were the most frequent bite site (53.8%). The offending animals, in order of frequency were dogs, cats, squirrels, monkeys, hamsters, and other animals, responsible in 5804 (65.9%), 2241 (25.44%), 343 (3.89%), 134 (1.52%), 125 (1.41%), and 159 (1.84%) cases, respectively. We found that animal bites are still prevalent in Iran and thus preventive measures and health education are required for the public.

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**Keywords:** Animal bite • epidemiology • rabies • Tehran

#### Introduction

Animal bite is defined as bite or claw wound from a pet, farm, or wild animal. Children are the most frequent victims of animal bites, with five-to-nine-year-old boys having the highest incidence. Men are more often bitten by dogs than are women (3:1), whereas women are more often bitten by cats (3:1).<sup>1</sup>

Dog bites make up 80 – 85% of all reported incidents. Cats account for about 10% of reported bites, and other animals including rodents, rabbits, horses, raccoons, bats, skunks, and monkeys, make up the remaining 5 – 10% of instances.<sup>1</sup> Cat bites become infected more frequently than dog bites. Although a dog's mouth is rich in bacteria, only 15

– 20% of dog bites become infected. In contrast, approximately 30 – 50% of cat bites become infected.<sup>2</sup>

The most common consequence of an animal bite is simple infection. The saliva of dogs, cats, ferrets, and rabbits is known to contain a wide variety of bacteria. According to one recent study, bacteria or other pathogens show up in about 85% of bites. The consequences of infection range from mild discomfort to life- threatening complications.<sup>1</sup>

More than 90% of animal rabies cases occur in wild animals such as skunks, bats, and raccoons, with domestic animals such as dogs and cats accounting for fewer than 10% of cases.<sup>1</sup> The World Health Organization (WHO) estimates that between 35,000 and 50,000 individuals worldwide die of rabies each year. The highest incidence of rabies occurs in Asia, where in 1997 over 33,000 deaths were noted, most occurring in India.<sup>3</sup>

So animal bite is a major public health issue, not only for the risk of acquiring secondary infections but also for the possibility of contracting rabies.<sup>4</sup> The objective of this study was to determine the incidence of animal bite, characteristics of the bitten persons, biting animals, and bite wounds in Tehran, Iran.

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## Materials and Methods

This retrospective study was performed on patients with animal bite referring to Antirabies Center of Pasteur Institute of Iran, Tehran, from March, 21<sup>st</sup>, 2003, through March, 20<sup>th</sup>, 2006. Data were collected via a questionnaire including questions regarding the characteristics of the bitten persons such as gender, age, job, residence area (town or suburb); biting animals, and bite wounds. Bitten persons were categorized into five age groups including <9, 10 – 19, 20 – 29, 30 – 39, and ≥40 years. Bites injuries were divided into two types including lacerations/scratch and punctures.

## Results

During the study period, 8,806 exposed persons treated for animal bites were included in our study. Ninety-four percent of the patients were from different areas of Tehran and 6% were from the suburbs. Of the patients studied, 79.16% were males and 20.84% were females. Bites were most frequent among the 20 – 29 years (30.1%) age group, followed by >40 (26.9%), 10 – 19 (19.9%), and 30 – 39 years (14.7%) age groups. Those aged <9 years had the least frequency of animal bite (8.4%). Most of the victims were self employed (25.82%) followed by students (16.18%). Upper extremities were the most frequent bite site (53.8%) followed by lower extremities (38.11%), head and neck (3.48%), and trunk (4.61%). Animal bites were more common in spring. Bites injury types included lacerations/scratches in 74.91% and punctures in 25.09% of the patients. The offending animals were dogs in 5804 (65.9%), cats in 2241 (25.44%), squirrels in 343 (3.89%), monkeys in 134 (1.52%), hamsters in 125 (1.41%), and other animals in 159 (1.84%) of cases (Table 1).

## Discussion

Animal bite is a major public health problem not only for the associated risk of acquiring secondary infections including those by *Clostridium tetani*, *Clostridium perfringens*, and occasional death due to trauma (which occurs often in children), but also for the possibility of contracting rabies, which if left unrecognized and untreated, is almost invariably fatal.<sup>4</sup>

Dog bites are responsible for about 80 – 85% of

**Table 1.** Distribution of biting animals, Tehran, Iran (2003 – 2006).

Biting animals	n (%)
Dog	5804 (65.9)
Cat	2241 (25.44)
Squirrel	343 (3.89)
Monkey	134 (1.52)
Hamster	125 (1.41)
Horse	26 (0.3)
Mouse	24 (0.27)
Fox	19 (0.21)
Rabbit	13 (0.15)
Sheep	12 (0.14)
Human	8 (0.1)
Other animals	57 (0.67)
<b>Total</b>	<b>8806 (100)</b>

animal bite wounds and cats account for about 10% of reported bites.<sup>1</sup> Foxes and other wild carnivores are also highly susceptible to rabies, while man, domestic dogs, and herbivores are less vulnerable.<sup>5</sup> In the majority of cases, the cause of rabies in humans is dog bites, however, fox and wolf bites have also been reported to convey rabies.<sup>4</sup>

In a recent study in the USA, women were bitten more often than men. The average male victim was younger than the average female victim. Men who were victims tended to be either very young or very old. The results showed that most bites occurred on the arm, followed by the breast. If stratified by gender, men were bitten on the arm more than women, and women were bitten on the breast more often than men.<sup>6</sup> In another study in Puerto Rico, the distribution of animal bites was equal in both men and women. Persons aged 18 years or older had the highest frequency of animal bites and attacks. The animal species reported to be involved in the majority of bites was the dog. Upper extremities were injured in 43% of these bites.<sup>7</sup>

According to the 33<sup>rd</sup> World Survey of Rabies for the year 1997, the highest incidence of rabies belonged to Asia, with 33,008 reported human deaths; mostly (~30 thousand) occurring in India. The dog was the main species involved and consisted of 90% of the total number of laboratory-proven animal rabies cases. With 1966 laboratory-proven cases, the highest number of rabies cases was reported by the Philippines, followed by Thailand.<sup>3</sup> Asia also carries 96.5% of the economic burden of rabies in the developing world with US\$ 560 million spent each year mostly on post-exposure prophylaxis.<sup>8</sup> In a recent study in Turkey, men comprised 66.7% of the cases of animal bites, and 43.5% of the total cases aged under 20 years.

In 74% of patients, the animal involved was the dog.<sup>9</sup> In India, 83.7% of cases of animal bite were bitten by dogs, followed by monkeys and cats. Of the total of 147 patients, 116 (78.9%) completed the postexposure prophylaxis which was observed more frequently in men and in young people.<sup>10</sup> In Japan, most victims are injured in the lower extremities mostly by stray or domestic dogs.<sup>11</sup>

In Iran, rabies has been detected in all provinces especially in north, northwest, and northeast of the country and has a significant role in economic loss and social disruption.<sup>12</sup> Rabies is endemic in the wildlife population in Iran where the infection of domestic livestock is frequent.<sup>13</sup> As a consequence, management of this problem is one of the most important priorities of Iran's Health Ministry.<sup>4</sup>

In a previous study conducted in Iran, the mean incidence of animal bites for the whole country was 95 per 100,000 population. Bites were frequent among the 10 – 29 years age group. Most of the cases were farmers and housewives, and they were mostly bitten on the feet or hands. In 1996, around 85% of cases were bitten by dogs, 4% by cats, and 11% by other animals.<sup>4</sup>

Some of our findings were similar to those reported earlier; men were bitten more than women<sup>9,10</sup>; persons aged 20 – 29 years had the highest frequency of animal bites and attacks<sup>7</sup>; the animal species reported to be involved in the majority of animal bites was the dog<sup>4,9-11</sup>; and also the upper extremities were the most frequent bite site.<sup>6,7</sup>

Our results were different from that reported by Zeynali et al.<sup>4</sup> in terms of patients' age, occupation, and the common bite site. This might be due to the fact that our study was conducted in Tehran, a megapolitan city, while their study was done throughout Iran. Also, the epidemiology of bite varies according to socioeconomic conditions in the country and the area (urban/rural) being considered. Other confounding factors that can influence the differences would be the age distribution of the population and the occupations people are involved with.

In conclusion, the results of this study showed that animal bites are still frequent in Iran, thus, different aspects of the issue should be highlighted in health education activities. In the general population, preventive measures and health education are required. Moreover, health-care providers must be trained in providing appropriate case for the bitten patient.

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