Short Communication

Total case of dog bites to humans and seasonal patterns of the bites

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Abstract

Dog bites are poorly understood and often underestimated public health problem as it causes huge medico-social problem as these attacks result in millions of injuries and thousands of deaths all over the world due to risk of rabies transmission. Approximately 1 in 20 dogs bite a human being during the dogs' lifetime. The present study estimated average annual dog bites to humans and indicate seasonal pattern of the bite in Addis Ababa in the year 2008 and 2009. All data on total, stray and owned dog bites to humans are obtained from human rabies post exposure treatment record of the Zoonoses Diseases Research Team in the Ethiopian Health and Nutrition Research Institute. The data used are all dog bite cases in Addis Ababa of the year 2008 and 2009. A seasonal pattern of dog bites are also analyzed from the same data in the study period. Average annual or seasonal dog bites are expressed as a percentage of total cases, or as a mean ± SD and one-way analysis of variance (ANOVA) was applied for seasonal pattern of dog bites. The X^2 test was used to determine the statistical significance between stray and owned dog bites. The average value for dog bites was 1097 ± 0.37/year for stray and 400 ± 1.06/year for owned dogs. In both years injuries caused by stray dogs was higher and significantly differed from injuries caused by owned dogs (t= 33.04, p=0.000). The highest average value of total dog bites was observed in the autumn months in 2008 (146.67 ± 0.89) as well in the autumn months for the two years together 281.67 ± 1.71). Mean of bites are significantly different between seasons in both years together (F=13.95, p=0.000).

Keywords: Addis Ababa, Dog bite, Human, Seasonal pattern

Introduction

Animal bites and scratches represent the most important public health issue related to dogs and cats because of the risk of rabies transmission and a huge medico-social problem as these attacks result in millions of injuries

and thousands of deaths all over the world (Nogalski *et al.*, 2007). According to WHO report, ten million people are bitten by animals around the world, considered for prophylaxis and treatment against rabies and almost 50,000 people die from this disease annually (WHO, 2003).

Dog bites are poorly understood and often underestimated public health problem (Feldman, 2004). Approximately 1 in 20 dogs will bite a human being during the dogs' lifetime (Griego *et al.*, 1995). Rabies problem has been greatest in Addis Ababa where the disease had been well established and become endemic (Girma Tefera *et al.*, 2002; Paulos Abebe *et al.*, 2003). Abraham *et al.*, (2010) indicated animal rabies case showed no decline in the annual number of confirmed rabid dogs from 2003 to 2009 and it is higher in stray dogs 86.3% and 73.5% in owned dogs.

Most dogs never bite a human; however, under certain circumstances, any dog is capable of inflicting harm. The most common victims of dog bites are children, especially in incidents that prove fatal (Sacks *et al.*, 1996). Almost one half of all reported cases of dog bites involve an animal owned by the victim's family or the victim's neighbors (Ndon *et al.,* 1996). There has been a distinct influence of the owner on the behavior of the dog. The reaction of the owner has a significant influence of the kind, frequency and seriousness of the accident. The spectrum reached from passive watching of the accident all the way to encouraging the dog to bite (Unshelm *et al.*, 1993).

In many countries, management of dog bites includes rabies prophylaxis. This cost, and costs from wound management, antibiotic, and tetanus prophylaxis can result in a substantial health care burden. These costs further underscore the need for more attention to research and prevention of dog bites. According to Schalamon *et al.,* (2006) for developing proper prevention strategies, it is important to understand the circumstances and characteristics of dog bites. The potential prevention of dog bites strategies include educational programs on canine behavior, especially directed at children; laws for regulating dangerous or vicious dogs; enhanced animal control programs; and educational programs regarding responsible dog ownership and training (Sacks *et al.,* 1996).

This paper presented the study of total dog bites to humans and indicate seasonal pattern of the bite in Addis Ababa in the year 2008 and 2009.

Methods

All data on total, stray and owned dog bites to humans are obtained from human rabies post exposure treatment record of the Zoonoses Diseases Research Team in the Ethiopian Health and Nutrition Research Institute. The data used are all dog bite cases in Addis Ababa of the year 2008 and 2009. A seasonal pattern of dog bites are also analyzed from the same data in the study period.

The results are expressed as a percentage of total cases of dog bites in the year (for stray and owned dogs), or as a mean ± SD for average annual or seasonal dog bites. One-way analysis of variance (ANOVA) was applied for seasonal pattern of dog bites. The X^2 test was used to determine the statistical significance between stray and owned dog bites.

Results

The total number of dog bites in humans by stray and owned dogs in the study period was 2994 with the average value of 1497 ± 16.63 per year. The highest incidence of total dog bites was observed in 2008 (1612 cases). The average value for dog bites was 1097 ± 0.37/year for stray and 400 ± 1.06/year for owned dogs. In both years injuries caused by stray dogs was higher and significantly differed from injuries caused by owned dogs (t= 33.035, p=0.000) (Table 1).

Table 1: Dog bites to humans in Addis Ababa in 2008 and 2009.

Year	Total dog bites	Stray dog bites	Owned dog bites	X^2	P
2008	1612	1030 (63.89)	582 (36.11)	91.710	0.000
2009	1382	1164 (84.23)	218 (15.77)	647.551	0.000
∑	2994	2194 (73.28)	800 (26.72)	649.043	0.000
X ± SD	1497 ± 16.63	1097 ± 0.37	400 ± 1.06	t-test 33.04	0.000

Note: X- Mean, SD-Standard Deviation.

The highest average number of total dog bites was observed in the autumn months in 2008 (146.67 ± 0.89) as well in the autumn months for two years together 281.67 ± 1.71 (Table 2). The average values of total dog bites are significantly different between seasons in 2008 (F= 54.26, p= 0.000). Similarly the average value of total dog bites are significantly different between seasons in 2009 (F=32.25, p=0.000). Mean of exposure of bites are significantly different between seasons of both years together (F=13.95, p=0.000).

Table 2: Dog bites to humans per season in 2008 and 2009.

Year	Parameter	Winter	Spring	Summer	Autumn	F-value	p
2008	Total dog bites	388	413	371	440		
	X ± SD	129.33 ± 1.95	137.67 ± 1.63	123.67±0.67	146.67 ±0.89	54.26	0.000
2009	Total dog bites	326	292	359	405		
	X ± SD	108.67±0.21	97.33±1.05	119.67±0.33	135±0.27	32.25	0.000
2008+ 2009	Total dog bites	714	705	730	845		
	X± SD	238±0.16	235±1.61	243.33±0.46	281.67±1.71	13.95	0.000

Note: X- Mean, SD-Standard Deviation.

Discussion

In this study, stray dogs caused higher number of bites than owned dogs. This is attributed to the fact that there are many stray dogs roaming on street in Addis Ababa which are contributing higher bite. The total dog bite found in the study period was highly underestimated that it only reflected cases that are presented and recorded in EHNRI. Similarly, Beaver *et al.,* (2001) reported that dog bite data are not really statistics, therefore the actual number of bites that occur in a community is not known, especially if they did not result in serious injury. In a different manner over half the dog bite injuries 58.0% were reported to have occurred at home by owned dogs in USA (Weiss *et al.*, 1998). It is because there is strict control of stray dogs in developed country.

In this study the incidences of bites are found higher in summer and autumn months. This is in line with the findings of Hanna and Selby, (1996) that they estimated that the highest incidence of bites occurred during the summer months. In the same manner, Ostanello *et al.*, (2005) reported that majority of the dog bites occurred during the spring and summer months. A survey conducted by Ndon *et al.,* (1996) in Milwaukee, USA disclosed that the majority of the dog bites 67% occurred during the spring and summer months. It is during these months that dogs are breeding and hence male dogs in a group are following a bitch for mating. Provocative actions and interference made by people especially children during this time might be contributing for higher bite.

The result suggested a need to educate the public about the magnitude of dog bite problems as dog bites represent a considerable public health burden and risk of rabies transmission. Dog bite prevention strategies include appropriate restraint of dogs in public places and reducing the number of stray dogs

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roaming in the community (animal control) and teaching people to refrain from behaviors likely to provoke bites.

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