

Epidemiological Features of Dog Bite and its Awareness among Victims: Report from Abbasi Shaheed Hospital Karachi

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Abstract

Objective: To estimate the burden of recently reported cases of dog bite in a tertiary care center of Karachi and to analyze the awareness of these victims or their attendants about dog bite or rabies.

Methods: This cross sectional study was conducted during January to June 2008 at Emergency department of Abbasi Shaheed Hospital. Our sample was comprised of 393 patients, reporting first time after stray dog bite incident. The relevant information was obtained regarding patients' age, gender, details of injury, management and patients' knowledge about dog bite and rabies. SPSS 13 was used to manage data and perform analysis.

Results: It was found that 83% of the victims were males and 52.4% were of less than 15 years of age. In our data, 26.7% victims reported within twenty-four hours of the dog bite. Mapping of dog bite cases revealed that 24% belonged to Orangi town while 14% each from North Karachi and Nazimabad. Knowledge of people related to rabies was very poor and 91% did not know that rabies could result after dog bite. Only 7% knew that rabies is a fatal disease and 0.7% responded that it can be prevented by vaccines.

Conclusion: Dog bite is a significant public health problem among young males with preponderance in certain areas of Karachi. Lack of education of people and lack of health communication reflected well through carefree practices and attitude of victims of dog bite.

Keywords: Dog bite, magnitude, Rabies, awareness, Karachi

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Introduction

Rabies is a disease of immense public health importance in developing countries where scanty and ineffective measures are adopted to control the

infection both in animals and in humans. A World Health Organization (WHO) rabies survey in 1992 estimated that 90% of human rabies occur in the developing world^{1,2}. All carnivorous animals including dog, cats, jackals, mongoose and rocon are considered potentially as rabid and transmit infection to human. Whereas rodents like mouse though not rabid but may harbor the infection and spread it through bite. Although it is an uncommon infection, the disease is uniformly fatal and ends in an extremely painful and torturous death if it becomes symptomatic³.

Globally, the incidence of human rabies is very low and virtually Europe, North Americas and Australia are declared to be free of human rabies^{4,5}. Rabies is endemic in Asia Pacific region while local

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epidemics are not uncommon. In India annual incidence of dog bite is 1.9%.² Of all the deaths reported due to Rabies each year, 95% occur in Asia and Africa and India alone accounts for 60% of all the world burden of rabies related deaths.

According to a study carried out in India, the Bangalore city has an estimated dog population of 3.25 lakhs⁶ while density of dog was reported as <10 dogs per Km² in Jodhpur and Mumbai⁷. The incidence of rabies was more in males and mostly (64%) resulted from stray dogs. About 86% of them received anti-rabies vaccination and none received life saving Anti-Rabies Serum (ARS)⁶. The annual incidence of human rabies reported was 15 and dog rabies 58 resulting in a ratio of 1:4 approximately as a rabies contagion index⁸.

Annually 55,000 deaths due to rabies have been reported in Asia & Africa⁹. Unfortunately no formal statistics are available regarding the burden of dogbite in our local population. According to some popular press release 7000 cases of dogbite is managed every year in JPMC. Moreover the veterinary services are barely monitored to show the extent of the problem in the community. Only few studies have been carried out to evaluate the compliance of post exposure treatment and barely couple of case reports are published¹⁰⁻¹⁴. All over the developed world, research is being done to control canine rabies by newer vaccines¹⁵ but because of lack of veterinary services and administrative constraints we are way behind.

This study is taken up as an initial effort to spotlight the burden of animal bite and peoples' awareness towards control of rabies. According to a projected estimate, dog population in metropolitan city of Karachi is 1.1 lakh (dog to human ratio is 1:145) and pet to stray dogs ratio is 1:100. Therefore in a city of more than 20 million people, almost 1.1 million are at risk of being bitten by animals and the figures can be more concentrated for rural and peri-urban areas in the out skirts of Karachi. It would be helpful in raising the awareness of the population at risk about rabies through health communication and directing municipality measures in

these potential areas subsequently. This study was carried out in order to analyze epidemiological features of dog bite in Karachi city and also to depict knowledge, attitude and practices of our local population regarding its complications and prevention.

Patients and Methods

This cross sectional study was conducted over a period of six months from January 2008 to June 2008 at Emergency department of Abbasi Shaheed Hospital (ASH). This project was carried out in collaboration of Community Medicine and Emergency department of KMDC & ASH. Abbasi Shaheed Hospital is a public sector tertiary care hospital catering to a large population of approximately five to six million as its catchment area.

Our sample was comprised of all those patients reporting first time to ASH with recent dog bite incident during that period. The study sample comprised of three hundred and ninety three (393) subjects irrespective of age and gender who reported directly or referred to emergency department at ASH.

The relevant information including patients' age, gender, details of injury, management and patients' knowledge about manifestations and complications of rabies were recorded through predesigned questionnaire. The questionnaire was pilot tested among few lay persons, prior to the initiation of the actual study.

Data was entered and processed using SPSS 13.00 software. Descriptive analysis was used to calculate the frequency and proportion of age, gender, treatment and management, knowledge and practices of patients, and geographical distribution of dog bite.

We used Arc View® software to show the distribution of dog bite incidence of our sample (Fig.1). Incidence of dog bite is estimated by taking whole population of reported towns in our sample as population at risk. We also calculated individual incidence for each town. All the statistics related to size of population were quoted according to the city district government official website.

Results

The mean age of the sample (393 cases) was found to be 21.5 ± 17.3 years with 52.4% (206) were less than 15 years, 37.4% (147) adults and 10% (40) cases were elderly; 83% (326) of all the victims were males.

Of all the dog bite victims, 26.7% (101/378) reported at Abbasi Shaheed Hospital on the same day within twenty four hours of the bite, while 73.3% reported between 24-48 hours of the incident. Most of the victims 24% belonged to Orangi town followed by 14% each from North Karachi and Nazimabad, 12% each from North Nazimabad and New Karachi while 11% from Federal B area (Fig.3). It was revealed that 54% (212) of victims were visitors in that area on that particular day of the bite.

In this study we estimated the incidence of dog bite for Jan-June 2008 as 7.8 dog bites per one hundred thousand populations in the vicinity of ASH (Fig. 1).

It was seen that 59% (231) of the cases were reported in the months of January and February and the common time of injury was late evening and early morning. Most of the victims in our sample sustained single site injuries. Injuries on leg account for 52% of the total cases followed by feet 26% and hand 14.8%. A total of 28 people (7.1%) were having multiple sites of injuries as shown in Table 1.

In 83% of the cases first reported at ASH, allegedly gave history of bleeding with bite mark while in 13% only abrasions and 7% only bite mark.

We calculated time delay by subtracting the day of bite from day of first reporting to our hospital. We were able to ascertain time delay in 378 out of 393 total reported cases of dog bites. The mean delay in days was 1.43 (SE 0.07 days) while median delay was 1 day with a minimum of zero day (same day reporting of incident) and maximum of eight days.

It was seen that 80% (317) were not at all aware of any serious consequences of dog bite that is rabies. Whereas 15% (62) thought that wound or local infection was the main problem to be managed by some injectable medicine Fig.2. Only 3.8% responders said that complications of dog bite can be prevented by vaccines whereas 93.2% showed vague or incomplete knowledge of preventive measures against dog bite.

Knowledge of people was very poor and 91% did not know that rabies is the disease that can result after dog bite. Only 6.9% knew that it is a fatal disease and 3.6% said that it can spread from animal to human while 0.3% responded that human-to-human transmission is possible Fig. 3.

Response rate for attitude towards control measures was only 46% (181/393). It was reflected that though 72% (130/181) noted but only 2% of them notified the authority regarding increased number of stray dogs in their area.

Discussion

All over the world, males are the predominant victims of dog bite¹⁻¹⁶ and so in our study with 83% males in total sample. The possible explanation for this high rate of male preponderance could be more exposure of males to outdoor activities due to our cultural and socioeconomic dependence on males.

Children are vulnerable habitants particularly in outside environment and high proportion of child victims 52.4% in our sample endorsed this fact and also well supported by other studies¹⁷⁻²⁰.

Earlier studies reported that most of the dog bites were on single site¹¹. Similarly in our data 93% of bites were of single site injuries with lower extremities as the most common site. It should be appreciated that western studies reported face, neck and head as the most common sites of bite¹⁹. Whereas, in our study and other local regional studies lower extremity was the most frequent site of bite by stray dog. This could be due to the cultural reasons in Asia region where dogs are mostly kept at a distance and pet dogs within the pre-

Table 1. Details of injuries among dog bite victims (n=393)

Extent of Injury	frequency	Percentage
lick	1	0.2
nibbling of uncovered skin	4	1.0
abrasion no bleeding	8	2.0
bite and bleeding	327	83.2
bite no bleeding	53	13.5
Site of Injury		
face	2	0.5
upper trunk	7	1.7
arm	9	2.2
hand	42	10.7
lower trunk	14	3.5
leg	217	55.2
foot	71	18
multiple	28	7.3

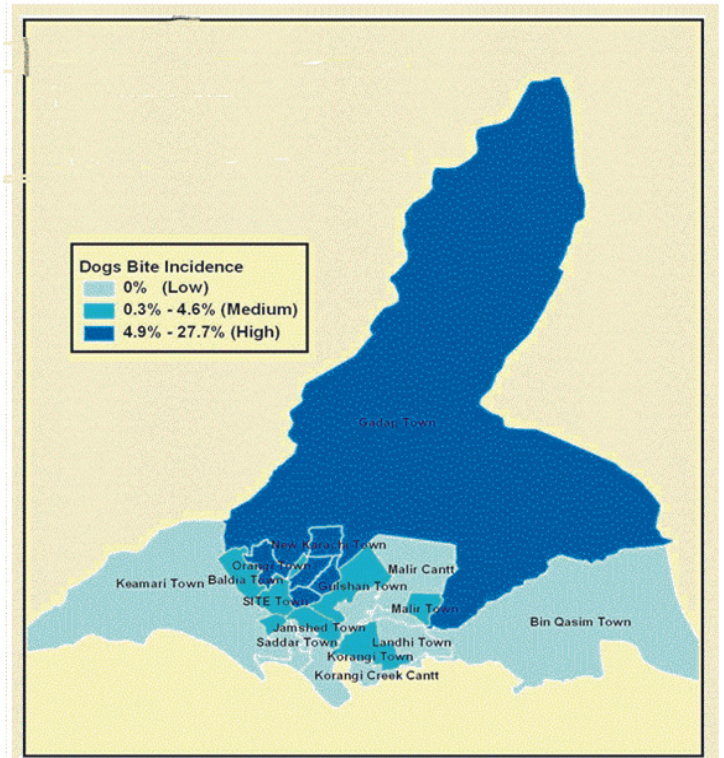


Fig 1. Reported incidence of dog bite from different towns of Karachi

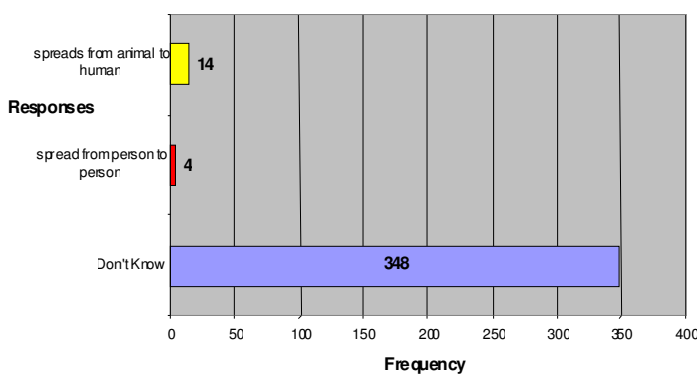


Fig 2. How Rabies can be contracted? (n=366)

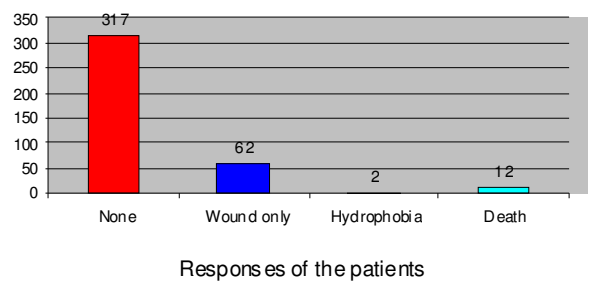


Fig 3. What could be the consequences after a dog bite? (n=393)

mises of home are rare finding. It is an observed fact that in western culture both children and adults interact and play with dogs and dogs live along with humans inside the home and have access to the bedrooms also¹³. As most of the dog bites are unexpected the site of bite depends mainly on the activity of the victim just prior to the bite.

It is a known fact that chances of dog bite are higher in those areas where human dog ratio is high. We found substantial reporting of dog bite from low socioeconomic area like Orangi Town and New Karachi. Reason may be due to the fact these communities have small houses, larger families and lack of recreation facilities especially for children and as a result they tend to play on streets and prone to get exposure to stray dogs.

Time of injury commonly reported in our study was late evening and early morning. The explanation of this may be the poor visibility and ideal time for stray dogs on streets. This is different from western studies where the peak incidence is early morning¹⁵⁻¹⁷.

Earlier studies have stated higher incidence of dog bite in harvesting season starting from April to September^{11,20,21}. In our data months of January and February showed higher incidence of dog bite. We may not be able to comment on this occurrence until a data is collected for over a whole year including all seasons.

Victims of dog bite having multiple bites were mostly (48%) young males and they gave history of dog bite in past as well. People, who were bitten previously, surprisingly did not get immunization against rabies and yet showed no signs of the disease. The speculated reasons may be poor knowledge of patients on rabies or they did not have a significant wound requiring the necessity to report to a doctor or any health facility or even that they had not followed the advice of the doctor or virtually the dog was not rabid as some of them would believe. Recommendations have been revised regarding immunization of man against rabies in order to achieve better compliance²².

In our study sample only 20% of the victims presented later than 48 hours following a dog bite. Although the median time delay in our sample was only one day the possible explanation for outstanding delay in some of our cases (20%) could be due to carefree attitude of the victims to the dog bite and its consequences. A study from Uganda reported time delay in presentation ranged from 0 to 327 days with a median of 2 days. Other studies reported that fear of multiple injection, cost of treatment and non-compliance with frequent visit to the facility are important factors in delayed presentation and non-compliance of treatment²³.

Limitation of study is that this study was carried out only during 6 months in a single tertiary care hospital due to lack of resources. The knowledge was assessed among those who are already affected which cannot be generalized to overall population.

It is recommended that public awareness campaigns and programs must be arranged for dog bite and use of media resources should be made effective for this purpose. Besides this some international guidelines towards primary and secondary prevention of rabies should be pasted on walls of emergency or primary health centers. Emergency room's record must be updated frequently and availability of vaccines should be ensured.

Conclusion

Dog bite is a significant public health problem with high frequency among young males and it was predominant in Orangi town area of Karachi. In half of the victims, reporting to tertiary care hospital was delayed for more than 24 hours for varied reasons and bleeding wounds were the commonest ones reported in time. Single site injuries were found to be more frequent. Furthermore, knowledge and attitude of our participants regarding complications and prevention of dog bite was very unsatisfactory. It can be postulated that lack of awareness of people and lack of health communication reflected well through their carefree practices and attitude towards serious problem of dog bite.

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Conflict of Interest

Authors have no conflict of interests and no grant/ funding from any organization for this study.

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