

Situational Analysis of Dog Bites in a Tertiary Care Hospital

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Abstract

Background: Dog bites are serious and often underestimated public health problem. It is important to understand the circumstances and characteristics of dog bites to develop effective prevention strategies.

Aims: To describe the factors and circumstances related to dog bites.

Methods: The study was conducted at B.J. Govt. Medical College and SGH, Pune. All the new patients of dog bite attending the ARV OPD during the period between 1st October and 31st November 2012 were included in the study. A pretested and structured oral questionnaire was used to collect data regarding victim, dog, place and bite. All the cases of dog bites were classified into three groups i.e. bites from pet, community or stray dogs. Analysis was done by the Chi Square test.

Results: Out of total 154 new cases of dog bites, a majority i.e. 102(66%) were caused by stray dogs, 27(18%) by pet dogs and 25 (16%) by community dogs. In case of pet-dog bites, 41% patients were children or adolescents. A significantly greater proportion of victims of pet-dog bites were playing with the dog when bite occurred ($X^2=45.84$; $p<0.05$). In a majority of the bites of pet and community dogs, the animal attacked victim from the front direction, ($X^2=30.18$, $p<0.05$). A majority of the community and stray-dog bites occurred outdoors while pet-dog bites occurred indoors, ($X^2=35.92$; $p<0.05$). In case of both the pet and community-dog bites, 44% were reported to be provoked while only 9% of stray-dog bites were provoked, ($X^2=21.36$, $p<0.05$). Only few of the community and stray-dog bites were thought to be preventable. A significantly more number of pet-dog bites (52%) were observed to be on face and upper limb, ($X^2=17.09$; $p<0.05$). A large number of victims with community-dog bites (52%) did not wash their wound with soap and water, ($X^2=15.77$, $p<0.05$).

Conclusions: A majority of the bites by stray dogs were unprovoked bites where the dog bit the victim's legs when he/she was walking on the road from the back without any warning. Hence there was a sense of helplessness on the part of the victims. The Municipal Corporation should take proactive steps to limit the menace of stray dogs. There is a need to stress the importance of registration/licensing and vaccination of the pet dogs.

Keywords: Dog bites, Pet-dog, Stray-dog, Community-dog, Questionnaire.

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1. Introduction

Rabies is an endemic disease in India and continues to be one of the most feared among all communicable diseases. With 20,000 deaths, 17.4 million animal bite cases annually India accounts for 36 % of the global and 65% of the Asian human rabies deaths [1]. It has been estimated that on an average a single case of animal

bite leads to a loss of 2.2 man days and the cost of medicines including ARV is Rs. 252/- [2]. Along with this financial burden animal bites also lead to a lot of anxiety and mental anguish for the patients.

While the focus in the prevention and control of Rabies has been on the provision of appropriate post

exposure prophylaxis, preventing animal bites is an equally important aspect. More than 90% of the animal bites have been reported to be caused by dogs [2-7]. Understanding the circumstances in which the dog bites take place will help in planning and implementing effective interventions for prevention of dog bite injuries. In this context, the present study was carried out with the objective of describing the factors related to dog bites in an urban set up.

2. Materials and Methods

The study was conducted at a tertiary care hospital in Pune, Maharashtra. All the new patients who were residents of Pune city and presented with a history of dog bite to the ARV (Antirabies Vaccine) OPD during the period between 1st October and 31st November 2012 were included in the study. Old Patients and patients with history of bite from other animals were excluded from the study. A pretested and structured oral questionnaire was used to elicit the required information regarding victim, dog, place and bite. All the cases of dog bite were classified into three groups i.e. bites from pet, community or stray dogs. A dog was classified as 'pet dog' if the dog had a well identifiable owner and was observable.

The dog was categorized as a 'community dog' if it did not have a well identifiable owner but was observable and as a 'stray dog' if it had no well identifiable owner and was not observable. Classification of exposures was done as per guidelines given by World Health Organization (WHO). A bite was considered as provoked if self-reported by patient and if the bite history consisted of any type of provocation. In all cases the type of bite was ascertained by enquiring about the details of the circumstances in which the bite occurred. If any provocation was identified in this description the bite was classified as a provoked bite. An ethical clearance was obtained from institutional ethical committee. Oral informed consent was taken from all patients. Analysis was done by the Chi Square test

3. Results

Out of the total 154 new cases of dog bite reporting to the OPD during the study period, a majority i.e. 102(66%) were caused by stray dogs, 27(18%) by pet dogs and 25 (16%) by community dogs. Only 4 (15%) of the pet dogs were owned by the victim themselves while the rest i.e. 23(85%) were owned by neighbors or other acquaintances.

Table 1: Characteristics of the Victim

VICTIM	Groups	Pet, N=27	Community, N=25	Stray, N=102	X ²	P value
Age	Children + Adolescents	11(41)	5(20)	27(26)	3.091	0.2132
	Adults	16(59)	20(80)	75(74)		
Gender	Male	21(78)	23(92)	90(88)	0.415	0.8124
	Female	4(22)	4(8)	12(12)		
What was the victim doing just prior to the bite	Walking	17(63)	18(72)	97(95)	43.42	0.0000001
	Playing with dog	9(33)	2(8)	0(0)		
	Others	1(4)	5(20)	5(5)		
History of previous bite	Yes	7 (25)	2 (8)	9 (8)	6.443	0.0399
	No	20 (74)	23 (92)	93 (91)		

Table 1 describes the characteristics of the victim. There was no significant difference in the age and gender distribution of the victims w. r. t the three categories of dogs. A significantly more proportion of the pet-dog bites occurred when the victim was playing with the dog. Nearly 25% of the victims of pet-dog bites reported a history of previous bites.

Table 2: Characteristics of the dogs

Dog		Pet, N=27	Community, N=25	Stray, N=102	X ²	P Value
What was the dog doing just prior to the bite	Rest	16 (59%)	20 (80%)	50 (49%)	45.84	0.0000001
	Playing with victim	9 (33%)	2 (8%)	0 (0%)		
	Not known	2 (8%)	3 (12%)	42 (41%)		
Direction of attack	Front/side	15 (55%)	15 (60%)	14 (13.72%)	33.18	0.0000001
	Back	12 (44%)	10 (40%)	89 (87.25%)		
Warning	Yes	11 (40.74%)	10 (40%)	52 (50.98%)	1.554	0.4598
	No	16 (59.25%)	15 (60%)	50 (49%)		

Table 2 describes the characteristics of the dogs. A significantly more number of pet dogs were playing with the victim prior to the bite. A major proportion of the stray dogs attacked the victim from the backside while more than half of the attacks of the pet and community dogs were from the front. In many of the cases in all the three groups the dog bit the victim without any prior warning. Only 9(34%) of the pet dogs were vaccinated. Overall, only eight dogs had puppies and 13 dogs were in a group when the incident of dog bite occurred.

Figure 1 describes the characteristics of the place where the dog bite took place. Nearly all the stray dog-bites and community dog-bites occurred outdoors while 37% of the pet dog bites occurred indoors. ($X^2=35.92, p=0.0000001$)

Figure 1: Place of dog bite

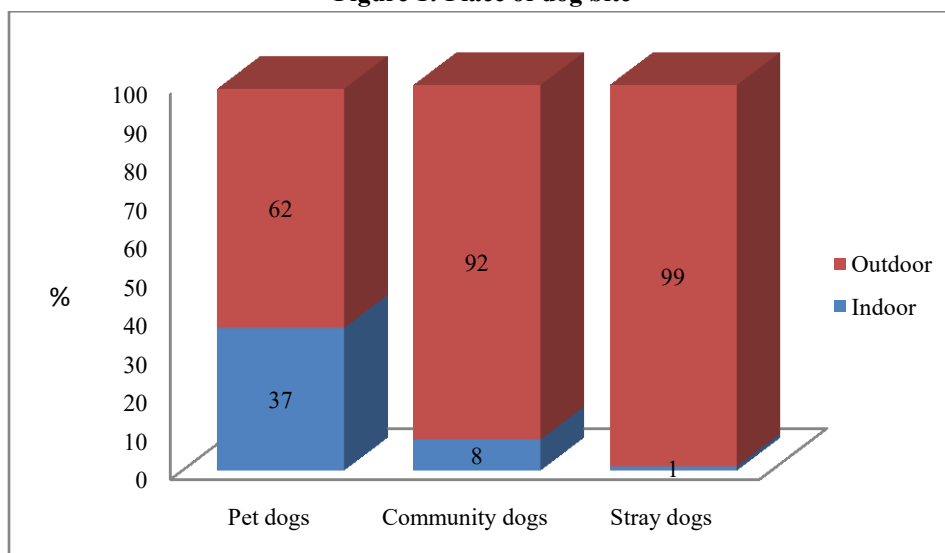


Table 4: Characteristics of dog bite

BITE		Pet, N=27	Community N=25	Stray, N=102	X ²	p
Type of bite	Provoked	12(44)	11(44)	10 (11)	21.36	0.00002295
	Unprovoked	15 (56)	14	92 (89)		
Site of bite	Upper Limb/Face	14 (52)	7 (28)	13 (13)	17.09	0.00019393
	Lower Limb	13 (48)	18 (72)	89 (87)		
Bitten part covered by clothes	No	5 (18)	1 (3)	4 (3)	7.797	0.02027
	Yes	22 (81)	24 (88)	98 (96)		
First aid	No first aid	6 (22)	11 (40)	11 (10)	15.77	0.003341
	Only water	2 (8)	2 (8)	7 (6)		
	soap and water	19 (70)	12 (44)	84 (82)		
Preventable	Yes	11 (40)	7 (25)	11 (10)	14.18	0.0008353
	No	16 (59)	18 (72)	91 (89)		

Table 4 describes the characteristics of the dog bite. A majority of the bites in all the three groups were Class III bites. Only two community-dog bites were Class II bites. In a significantly more proportion of the pet and community-dog bites the dog had bitten the victim as a result of a provocation. A significantly more number of pet-dog bites were thought to be preventable and less number of victims of community and stray-dog bites thought that the dog bites were preventable. A significantly more number of pet-dog bites were on the upper limb or face and in 18% of the cases the pet-dog bites were not covered with clothes. A large proportion of victims of community-dog bites reported not using any first aid immediately after the bite.

Table 5: Examples of provocations causing dog bites

Pet dog	Community dog	Stray dog
Irritated the dog while playing	Irritate while playing	Hit dog with stone
Tried to stop fight of pet dogs	Shoo away dog	When the victim taking his vehicle off its stand a dog resting beneath it was disturbed
Victim disturbing dog's owner	Shouted at the dog	When the victim was going along a road an autorickshaw driver started the vehicle and the dog resting beneath the auto was irritated and attacked the victim
Applying antiseptic lotion to the dog	Play with puppies	When the victim sat on a bench in a park a dog with puppies beneath the bench attacked the victim
Put foot over sleeping dog	During a dog fight victim tried to save the pet dog	Unknowingly put foot over sleeping dog
	Unknowingly put foot over sleeping dog	

Table 5 describes the provocations which led to dog bites in the three categories. Many of the provocations of the pet and community dogs were direct provocations while in some cases of stray-dog bites the dog had been provoked unknowingly.

4. Discussion

A majority of the dog bites were caused by stray dogs. In other studies too majority of the dog bites have been reported to have been caused by stray animals [1,7,8]. Another study has reported that more than 60% of the animal bites were unprovoked bites by stray animals [7]. Many studies have reported the lower limb to be the most common site of bite [2,7-12]. In this study a majority of these bites by stray dogs were unprovoked bites where the dog bit the victim's legs when he/she was walking on the road. In many cases the stray dog bit the victim from the back without any warning. Even amongst the provoked bites it was noted that in many cases the stray dogs had been unknowingly provoked leading to a bite. A majority of the victims of stray dog bites felt that such bites were not preventable. This indicates a sense of helplessness on the part of the victim. There is a need to address the problem of the stray dogs. The Municipal Corporation should take proactive steps to limit the menace of stray dogs. Studies conducted in Jaipur, Rajasthan have shown that street dog sterilization programme can reduce human dog bite injuries significantly [13, 14].

A significant proportion of the victims of bites of pet dogs were children or adolescents. Many of these bites were provoked bites which occurred when the victim was playing with the dog. A majority of these pet dogs were owned by neighbours, none were registered and many were not vaccinated. The site of bite was either the upper limb or the face in a majority of these cases. A large number of bites of pet dogs occurred indoors. In a study it was reported that 66% of the total animal bites in children were provoked bites [7]. In another study of the total animal bites in children in 57% cases the bite was provoked bite and in 61% cases the bites were by pet dogs [15]. Bites and maulings by dogs, sometimes fatal, are a worldwide problem and particularly affect children. Every year 250000 people who have been bitten by dogs attend minor injuries and emergency units in the United Kingdom and some of them are admitted to hospital for surgical debridement or intravenous surgical debridement or intravenous antibiotics [16]. As part of the Millennium Development Goals to reduce poverty and preventable childhood deaths from infectious diseases, especially in resource-limited regions of the world, dog-mediated rabies has been targeted for global eradication by 2030 within all endemic regions [17].

Rabies deaths result from a failure to give adequate prophylaxis [18]. Optimal treatment of dog bites starts with generous irrigation of the wound with saline solution and debridement, including removal of foreign bodies and devitalized tissue. If there is any suspicion of infection, cultures of blood and purulent fluid should be obtained, as

cultures only of the wound may be contaminated by skin flora [19]. The lack of awareness regarding rabies amongst rural primary care health staff and their adverse practices towards the management of dog-bite wounds is a major contributor to the high incidence of rabies infection and subsequent human mortality in India [20]. Efforts to initiate/upgrade additional rabies diagnostic facilities, and enhance human and animal rabies surveillance are essential to indicate the true disease burden and institute appropriate public health measures. Adequate doses of rabies vaccines and RIG must be made available in public health care centres, especially in rural areas across the country [21]. Rabies is endemic throughout the country, except for the Union Territories of Andaman and Nicobar and Lakshwadeep, which have not reported any clinical rabies, either in human beings or dogs [22]. Rabies is considered to be virtually 100 % fatal, and without critical care, most patients reportedly die within 2–3 days of admission [23]. To first reduce then eradicate deaths from rabies, collaborative efforts will be required from multiple stakeholders, including veterinarians, public health officials, legal authorities and other health care services [24]. WHO recommended post exposure prophylaxis (PEP), using WHO recognized rabies vaccines, induces an effective circulating virus killing serum antibody level, but only after a delay of 10–14 days [25].

The care and management of the Pet dogs has been reported to be very unsatisfactory in a multi-centric rabies survey conducted in India [1]. There is a need to stress the importance of registration/licensing and vaccination of the pet dogs. An intensive IEC activity regarding this can be organized in the schools and colleges of the city in which the risks involved importance of registration, vaccination and first aid need to be communicated. The children should be told to communicate these messages to the neighbours too.

Most of the studies reporting dog bite consider only two categories of dogs i.e. the street/stray and the pet dog. But in this study based on the data provided by the respondents we have included a third category of 'community dogs'. Many of the neighbourhoods in the city have such community dogs wherein the responsibility of the dog is not fixed on any particular individual or household. The dog moves about in the neighbourhood and is fed by the households in the neighbourhood. A significant proportion of the bites of the community dogs were provoked bites in which the dog attacked the victim from the front and bit the leg when the victim was walking. Many of the patients with community-dog bites reported inappropriate first aid. There is a need to involve the community based organization to adopt the community dogs and take up the responsibility of their registration and vaccination.

5. Conclusion

A majority of the bites by stray dogs were unprovoked bites where the dog bit the victim's legs when he/she was walking on the road from the back without any warning. Hence there was a sense of helplessness on the part of the victims. The Municipal Corporation should take proactive steps to limit the menace of stray dogs. There is a need to stress the importance of registration/licensing and vaccination of the pet dogs. An intensive IEC activity regarding this can be organized in the schools and colleges of the city.

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