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Research Article
Epidemiological

An epidemiological study of dog bite cases in a rural area of Salem, Tamil Nadu

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Introduction: Rabies is a viral zoonosis. In up to 99% of cases, domestic dogs are responsible for rabies virus transmission to humans. About 30% of the victims of dog bites are children under the age of 15. **Objective:** To assess the epidemiological pattern of dog bite cases, which formed the majority of cases attending anti-rabies clinic. **Materials and Methods:** This study was conducted at the Primary Health Centre,Poolavari, Salem, Tamil Nadu, India between Feb 1st- May 1st 2018. It is a cross sectional study, where all dog bite cases attending injection OPD were studied. **Results:** Highest percentage of dog bite victims belonged to the age group of 5-25Years (33.7%). The bites were mostly by pet dogs (75.5%). 91.8% of the dogs were not vaccinated. Running, patting were the most common factors leading to dog bites (50.0%). 52% of the study population had awareness of first aid for dog bite. 88.8% population had awareness about Anti rabies vaccines for dog bites. **Conclusion:** The study concludes that awareness of first aid for dog bites ,pet dog vaccination, awareness about Anti rabies vaccine for dog bites and completion of the treatment should be increased in the rural population.

Keywords: Dog bite, Rural Area, Vaccination, Epidemiology

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Introduction

Rabies, caused by bites of warm-blooded animals, is almost always fatal after the onset of clinical signs. The disease can efficiently be averted by avoiding contact with wild animals and postexposure prophylaxis (PEP) [1].

Canine rabies causes approximately 59,000 human deaths globally, over 3.7. million disability-adjusted life years, and 8.6 billion USD economic losses annually [2]. Around 15 million animal bites requiring post exposure rabies prophylaxis, the majority by dogs, occur in India every year [3].

There are little data on the incidence of animal bites from India. A study carried out a decade earlier had reported that the national incidence of animal bites as 17.4/1000 population [4].

The World Health Organi-zation (WHO) supports targets for elimination of human rabies transmitted by dogs in South-East Asia by 2020. In this region, a 5-year plan (2012–2016) aims to halve the currently estimated number of human rabies deaths in endemic countries [5].

Data regarding community- based estimates of dog bites are required to track progress of such measures but are lacking in India, as they are the most common animal bites. The available studies on dog bites and rabies in India are mostly hospital-based, and limited to disease management [6,7,8].

Objectives

To study the epidemiologicalfactors of dog bite cases,which formed the majority of cases attending anti-rabies clinic of Primary Health Centre,Poolavari.

Materials and methods

Study area and Period: This study was conducted at the Primary Health Centre, Poolavari, Salem, India between Feb 1 st - May 1st 2018.

Study Type- It is a cross -sectional study, where all dog bite cases attending injection OPD were studied.

Sampling Design: Convenient sampling was done.

Study Method: Using pre-tested structured question-naire, the dog bite patients were interviewed, as they formed the most common animal bite cases.

They were asked about the dog that had bitten them, the type of dog-pet or stray, site of bite, reasons for bite, whether dog was vaccinated or not, time taken to seek treatment, first aid given and regarding post exposure prophylaxis. The socio demographic characteristics, epidemiological and associated factors for dog bites were also studied.

Inclusion Criteria: Only dog bite cases coming for vaccination were taken for study.

Exclusion Criteria: Other animal bite cases andthose who were unwilling to participate were excluded.

Statistical Analysis: Frequencies and Percentages

Percentages of the study population, their socio demographic characters, their nature of dog bites, first aid taken, vaccine administered and reasons for not vaccinating were studied.

Results

Table-1: Socio demographic characteristics of study population.

Socio-demographic characters	Subjects with Dog bites in the last 3 months Number (%) n=98
Age (Years)	
<5	1(1)
5-25	33(33.7)
26-45	32(32.7)
46-65	30(30.6)
>65	2(2)
Sex	
Male	56(57.1)
Female	42(42.9)
Education	
Illiterate	45(45.9)
Primary	36(36.7)
Middle	8(8.2)
High school	9(9.2)
Occupation	
House wife	22(22.4)
Weaver	15(15.3)
Student	25(25.5)
Coolie	11(11.2)
Agriculture	12(12.2)
Others	13(13.3)
Socio-economic class	
Middle upper	17(17.3)
Middle lower	11(11.2)
Lower upper	41(41.8)
Lower lower	29(29.6)

Socio-demographic characteristics of the study population were compared with one another to find which of the characteristic ranked the highest in association with dog bite. Most of the victims belonged to the age group 5-25 years (33.7%). followed by age group 26-45 (32.7%) and 45-65 years (30.6%).

The percentage of male victims (57.1%) were higher compared to the female victims (42.9%). Dog bites in students ranked the highest of 25.5%. Secondly, Coolie (11.2%) and agricultural workers (12.2%) recorded a total of 23.7% of dog bites, which results in a conclusion that occupational environment is one of the main risk factors for dog bites.

Most of the victims belonged to socio-economic class – lower upper (41.8%), followedby Lower lower (29.6%). Victims of classes Middle upper andMiddle lower recorded comparatively lower percentages of dog bites (17.3% and 11.2% respectively).

Table-2: Showing dog bite cases bitten by type of dogs.

Type of dog bites	Frequency	Percent
stray	24	24.5
pet	74	75.5
Total	98	100.0

75.5% of the bites were by pet dogs. Stray dog bite was only 24.5%. Thebite percentage was more by pet dogs.

Table-3: showing vaccination status of bitten dogs

	Frequency	Percent
yes	8	8.2
no	90	91.8
Total	98	100.0

91.8% of the pet dogs were not vaccinated. Only 8.2% of the dogs were vaccinated. The results of vaccination status of the bitten dog were unsatisfactory It was found that running and patting of the dogs were the most common factors leading to dog bites (50%). Provoking gestures (27.6%) and playing (22.4%) were said to be other reasons by the bite victim.

Fig 1 shows that the most common bite site was leg (56.1%), followed by hand (27.6%). Bites in the trunk was 7.1% and the body bites was 3.1%. Bites in the trunk and body were less common.

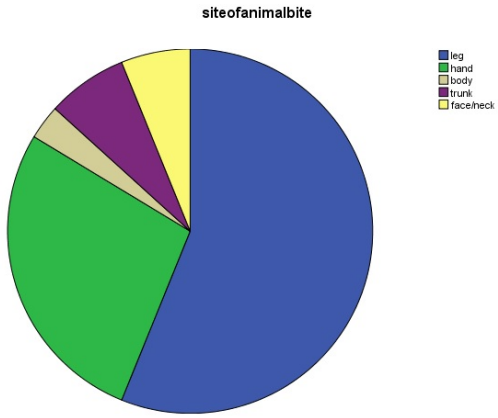

Fig-1: Distribution of site of dog bites

It was found that only 48 % of the study population had awareness of first aid givenfor dog bite cases. Hence there is a need to create awareness regarding first aid to dog bite victims. Whereas, 88.8% of the study population was aware of Anti rabies vaccination for dog bites.

Table-4: shows distribution of duration before taking treatment for dog bites.

Duration before taking treatment		Number of dog bite cases	%
	within 1/2hr	30	30.6
	1/2-6hrs	26	26.5
	6-12hrs	28	28.6
	more than 12hrs	14	14.3
	Total	98	100.0

Table 4 shows that 30.6% of the victims took treatment within ½ an hour of bite, 28.6% took treatment between 6-12 hours and 26.5% took treatment between ½ - 6 hours. The percentage of victims who took treatment after 12hrs was 14.3%.

Table-5: shows distribution of dog bites cases taken treatment.

Type of treatment	Frequency	%
Allopathy	80	81.6
indigenous treatment (turmeric, kerosene, mud, limestone,)	18	18.3
Total	98	100.0

81.1% of the study population tookallopathy treatment and 18.3% underwent other forms of indigenous treatment like usage of turmeric, mud and limestone.94.9% cases had taken Anti rabies vaccination, while 5.1% had not taken Anti rabies vaccination.

Table-6: shows distribution of cases with complete treatment.

Treatment taken	Frequency	Percent
complete	74	75.5
incomplete	24	24.5
Total	98	100.0

It was found that cases who completed treatment was only 75.5%. 24.5% of the study population did not complete the treatment.

Table-7: shows reasons for incomplete treatment.

		Frequency	Percent
Valid	Far distance	2	8.3
	Others-fear of injection	2	8.3
	Ignorance	20	83.3
	Total	24	100

Ignorance was the main reason for incomplete treatment 83.3%. Far distance and fear of injection were the other reasons for incomplete treatment.

Discussion

Our study conducted at Poolavari Primary Health Centreshowed that the 75.5% dog bite cases were caused by pet dogs. An epidemiological study of animal bites among rural population in Tamil Nadu, India showed similar results where bite by pet dogs were more common (59.42%) [9].

The increased incidence of pet dog bites stresses the importance of pet dog care and vaccination. WHO sponsored National Multi-Centric Rabies survey showed that bite by stray dogs in rural area was 63.6% compared to the bite by pet dogs 36.4% in rural [10].

It was found in our Poolavari PHC study that most of the dog bite victims belonged to the age group of 5-25 (33.7%), followed by victims in age group 26-45 (32.7%) and victims in age group of 45-65 (30.6%). Victims belonging to age group >65 and <5 recorded less number of animal bites, 2% and 1% respectively.

Research paper on Knowledge, Attitude and Practices Regarding Dog Bites and its Management Among Adults in Rural Tamil Nadu showed results where people of age group 41-60 years recorded 29.8% of bites. But the highest was among the age group 20-40 years (57.5%) [11]. 57.1% victims of dog bites in our study population were males. 42.9% victims were females.

The results of WHO sponsored National Multi-Centric Rabies survey showed similar results in which victims were mostly males (68.5%), female victims were lesser in percentage (31.3%) in rural area [10].

Our study found that 45.9% dog bite victims were illiterate and victims who had finished their primary education were the second highest (36.7%). It was observed by the epidemiological study of animal bites in Tamil Naduthat illiterate and people who had completed primary education both having an incidence of 21.74% each [9].

Our study shows that percentage of dog bites in students were 25.5% which is the highest. Bite percentage was second highest among the housewives which was 22.4%, weavers had 15.3% of bites. An epidemiological study of animal bites among rural population in Tamil Nadu found that students had 34.78% of dog bites, the percentage of student victims were almost similar to our study [9].

A cross sectional study to understanding demographics of dog bite victims attending anti rabies ward in Chennai city, Tamil Nadu observed that bite percentage among studentswas 33.98% and among housewives was 10.16% [12]. Epidemiological study of animal bite victims in Central India found that student bite percentage was 18.2% and bite percentage in unemployed and house wife was 10.3% [13].

Our study showed that the most common factor leading to dog bites was running and patting about 50.0%, bite due to provoking gestures was 27.6%. Epidemiological study of animal bite victims in Central India found that 75.9% of bites were unprovoked and 24.1% of bites was due to provoking gestures [13] A cross sectional study to understanding demographics of dog bite victims attending anti rabies ward in Chennai city, Tamil Nadushowed that provoked bites was the highest (60.55%) [12].

Ourstudy showed that the most common site of bite was leg 56.1%. A cross sectional study to understanding demographics of dog bite victims attending anti rabies ward in Chennai city, Tamil Nadurecorded 59.77% bites in lower limb and 33.59% bites in upper limb[12].The vaccination status of bitten dog in our study shows that only 8.2% of dogs were vaccinated, the rest 91.8% of dogs were not vaccinated.

A cross sectional study to understanding demographics of dog bite victims attending anti rabies ward in Chennai city, Tamil Nadufound that 33.59% of the dogs were vaccinated, 13.67% were not vaccinated, and the vaccination status of the other dogs were not known [12].

Ourstudy showed that 30.6% of victims took treatment within ½ hr, 28.6% took treatment within 6-12hrs, 26.5% within ½-6 hrs and only 14.3% took treatment after 12 hrs. An epidemiological study of animal bites among rural population in Tamil Nadu, India observed that 60.78% victims had taken treatment within ½ hr, 9.8% had taken treatment within 6-12hrs, and 13.73% victims had taken treatment after 12hrs. The percentage of victims taking treatment after 12hrs were almost similar to our study [9].

Our Poolavari PHC study showed that 81.6% of the victims opted for allopathy treatment and only 18.3% took indigenous treatment with turmeric, kerosene, mud and limestone. A cross sectional study to understanding demographics of dog bite victims attending anti rabies ward in Chennai city, Tamil Nadu found that 50.78% washed wound with water/ soap with water as a first aid measure, 21.86% consulted Physician as first aid measure and 11.72% underwent unconventional intervention [12].

Prevalence of Dog Bites in Rural and Urban Slums of Delhi: A Community-based Study found that in rural area of Delhi 42.7% washed the wound with soap and water as first step ofmanagement, 2.4% washed the wound with water only, 25.9% sought help of qualified professional and 28.9% underwent traditional methods of treatment [14].

Ourstudyfound that 75.5% cases had completed the treatment,while 24.5% cases had not completed the treatment. The important reason for incomplete treatment 83.3%, were ignorance about consequences of dog bites.Prevalence of Dog Bites in Rural and Urban Slums of Delhi: A Community-based Study found that 82.5% of the bite victims coming from the rural area were not aware of the injections given after dog bite.

Conclusion

The dataconcludes thatLower socio-economic classes, and illiterates were prone to higher percentage of dog bites. Males had higher incidence compared to females, the reason being occupational environment.

Student victims were more compared to other occupations, the reason varied from one another (the main reason being running, patting and playing with dogs.). The bite from pet dogs were more common, whereas the awareness regarding pet dog vaccination was poor, which indirectly stresses the importance of pet dog vaccination by every dog owner to prevent Rabies.

The interns,who collected the data from dog bite victims gave them health education regarding awareness of first aid for dog bites,pet dog vaccination, awareness about Anti rabies vaccine for dog bites and completion of the treatment.

Suggestions: Pet dog vaccination should be intensified among general public along with awareness of first aid fordogbites, awareness about Anti rabies vaccine for dog bites and completion of the treatment to prevent deadly disease Rabies.

Limitation

This study was conducted only in the patients attending the Outpatient ward in the Poolavari PHC.

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