

A Community based cross sectional study of dog bites in children in a rural district of Tamil Nadu

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Received June 28, 2016. Accepted July 13, 2016

Abstract

Background: Worldwide dog bites are becoming a significant public health problem and the annual frequency of dog bite injuries in children is estimated to be 22 per 1000 children of which less than half of them are reported in medical facilities.

Objective: To study the period prevalence of dog bites in children, its risk factors and treatment seeking behavior.

Materials and Methods: The present cross sectional study was conducted in field practicing areas of rural health centre covering 4150 households in 34 villages involving 5841 children. Data was collected by trained medical interns and social workers. Collected data was entered and analyzed using EPI_INFO software (3.5.3).

Result: The period prevalence of dog bites episodes in last one year is 17.9 per 1000 children. Most of bites happened in male children (51.5%), less than 10 years of age (56%), and children below poverty line (80%). Almost 78% of bites are unprovoked and the most common place of bites is in and around the house (70%). The most common site of bite is lower limb (53.6%) followed by upper limb (27.6%). The most common treatment source for bites is primary health centre followed by traditional faith healers. Almost 67% of wounds belonging to class 3 wounds but only 4% of dog bite victims received immunoglobulins.

Conclusion: Period prevalence of dog bites is high and it is common in children belonging to poor socioeconomic conditions. In a country with very high population of unvaccinated dogs, health education program focusing on prevention of dog bites, correct methods of local wound treatment, vaccine, and rabies immunoglobulin's are needed.

KEYWORDS: Children, dog bites, anti rabies vaccine

Introduction

Worldwide dog bites are becoming a significant public health problem and the annual frequency of dog bite injuries in children is estimated to be 22 per 1000 children of which less than half of them are reported in medical facilities.^[1] Paediatric dog bite injuries are considered as medical and public health issue with functional, aesthetic, psychosocial consequences, and rabies.^[2] Studies have shown that when compared to adults, children are at higher risk of dog bites and most of

victims are bitten by familiar dog.^[3] In India, most of the animal bites are due to dogs of which 60% due to stray dogs and 40% by pet dogs. Children make up the largest percentage of people bitten by dogs, which is mostly under-recognized and underreported.^[4,5] Most of the dog bites in children were simply ignored or treated with indigenous products.^[6,7] Most of the deaths following dog bites due to rabies can be prevented by simple wound washing, proper treatment, vaccination, anti-rabies immunoglobulins. The available literature on dog bites focuses predominantly on hospital based patients for post exposure prophylaxis for rabies and the true incidence of dog bites in children and its risk factors in the community were not available. For developing any prevention strategies and programs it is necessary to understand circumstances and characteristics of dog bites. Hence, the present study was carried out with the objectives of finding the period prevalence of dog bites, risk factors and treatment seeking behaviour among children. This present study provides more accurate estimate of actual number of dog bites in a representative population of children.

Access this article online

Website: <http://www.ijmsph.com>

DOI: 10.5455/ijmsph.2017.28062016568

Quick Response Code:



Materials and Methods

Study area and setting

The present cross-sectional study was conducted in the field practising areas of rural health training centre (RHTC) located in Thiruvainallur, is the peripheral centre of the department of community medicine, Sri Manakula Vinayagar Medical College and Hospital. The field practising areas of RHTC is 34 villages covering a population of 63921.

Sample size and sampling

The present data was taken from survey of animal bites and envenoming in rural population which was conducted by the department. Sample size calculation and sampling techniques were discussed elsewhere.^[6] In the present study, 5841 children less than 18 years of age were included.

Data collection tool

A questionnaire was prepared consisting of basic socio-demographic features, history of any dog bites in children in the preceding 12 months, risk factors, and local practices and treatment seeking. The prepared questionnaire was pilot tested in a village where study was not conducted to check the validity of its content and necessary corrections were made.

Data collection

Data was collected for a period of one year. Trained medical interns and social workers collected data by house to house visit in all the villages. Households were selected by systematic random sampling method. All the children less than 18 years in the household were included in the study. Trained interns and social workers after obtaining written consent administered the questionnaire to the respondents. Housewife of the house or any other responsible adult was enquired about the bites caused to children during last one year. To ensure quality of data, filled up questionnaires were randomly rechecked in the field for accuracy and completeness of the data by post graduates and faculty of community medicine department.

Data Analysis

Data was entered and analysed in Epi_info (3.4.3) software. The prevalence of bites was estimated as proportion and frequency and proportions were calculated for risk factors.

Results

The period prevalence of dog bites episodes in last one year is 17.9 per 1000 children. Among males, 54 (51.5%) episodes of dog bites have occurred and 51 (48.5%) among females. Approximately 57 (56%) bites occurred in children less than 10 years and 46 (44%) occurred in children more

than 10 years. Around 83 (80%) bites occurred in children below poverty line and 37% of bites occurred in children living from kachha house (Table 1).

Almost 82 (78%) bites were unprovoked and 23 (22%) bites were provoked. Outcome following bites shows that 100 (95%) have recovered and there is a single death have occurred following dog bite. Most common site of bite is lower limb (53.3%) followed upper limb (27.6%), and trunk (8.6%). The most common place of bite is in and around house (70.4%). In 64 (61%) cases the bitten dog was healthy and in 3 cases the bitten dog was either sick or died following the bite (Table 2).

In 16 (15%) of dog bite victims there were 2 or more than 2 wounds were present. Among the dog bite cases, 70 (66.6%) had bleeding at the site of the bite and this indicates they were class 3 bites. Following dog bites, 67 (64%) washed their wounds and among them only 38 (36%) used soap and water for washing. In 22 (21%) cases applied irritants such as onion, ash, lime etc. on the wounds. Primary health centre (PHC) was the main source of treatment in 68 (65%) cases followed by traditional healers in 17 (16%) cases. Among the victims, 74 (70.4%) cases have taken vaccine and 31 (29.6%) have not received vaccine. The life saving measure of rabies immunoglobulins were taken only by 4 (3.8%) of the cases (Table 3).

Discussion

The period prevalence of dog bites in children was 17.9 per 1000 children. Among the study population the number of episodes of dog bites is higher in males, age group of 1–10 years and children below poverty line. Most of the bites (78%) are unprovoked and case fatality rate is around 1%. Most common site of bite is lower limb (53.3%) and 70% of bites happened in and around the house. Following dog bites, 36% of cases did not wash their wounds and among those who

Table 1: Sociodemographic characteristics of dog bite victims

Variables	Dog bites	
	Yes (%) N-105	No (%)
Sex		
Female (N-2864)	51 (1.7)	2813 (98.3)
Male (N-2977)	54 (1.8)	2923 (98.2)
Age (years)		
1-10(N-3208)	59 (1.8)	3149 (98.2)
11-18(N-2633)	46 (1.7)	2587 (98.3)
Socioeconomic status		
APL (N-975)	21 (2.1)	954 (97.9)
BPL (N-4866)	84 (1.7)	4782 (98.3)
House type		
Pucca house (N-2038)	31 (1.5)	2007 (98.5)
Semi pucca (N-2000)	35 (1.7)	1965 (98.3)
Kachha (N-1803)	39 (2.1)	1764 (97.9)

Table 2: Characteristics of dog bites

Variables	Dog bite N-105	Percentage (%)
Nature		
Provoked	23	21.9
Unprovoked	82	78.1
Outcome		
Recovered	100	95.2
Disability	4	3.8
Death	1	1
Site of the bite		
Lower limb	56	53.3
Upper limb	29	27.6
Head and neck	5	4.7
Trunk	9	8.6
Others	6	5.8
Place of bite		
House	74	70.4
School	8	7.6
Work	9	8.5
Others	14	13.5
Fate of the animal		
Healthy	64	60.9
Sick	2	1.9
Dead	1	1
Killed	7	6.6
Unknown	31	29.6

washed only 36% used soap for washing. Among the cases 21% applied irritants over the wounds and 16% visited traditional healers for treatment. Anti-rabies vaccine was not given in 30% of cases and rabies immunoglobulins were given in 4% of cases.

The present community based cross-sectional study covered a large representative sample of 5841 children using systematic random sampling method. Most of the studies available are hospital based and this community based study highlights dog bites in children which is a vulnerable population and their treatment seeking behaviour.

This study demonstrates slight male predominance in the dog bite cases and similar findings were reported by Van et al.^[9], Osaghae^[10] and Kale et al.^[11]. In the present study, around 56% of bites occurred in children less than 10 years of age and children often play near stray dogs, which are many and roam freely, and are used to share their food with them, which results in frequent bites. Usually children tend to underestimate the danger signs arising from dogs because of inexperience and carelessness and highest incidence is reported in 5–9 year old boys. This reflects the natural behaviour of young boys including playing, yelling, grabbing, and having eye contact which puts them at a high risk for injuries and this requires constant supervision by parents and caregivers to avoid unwarranted attacks by wandering dogs.^[12] Osaghae^[10]

Table 3: Characteristics of the wound and the treatment

Characteristics	Dog bite N-105	Percentage (%)
Number of wounds		
1	89	84.7
2	11	10.4
3 or more	5	4.9
Bleeding		
Yes	70	66.6
No	35	33.4
Wound wash		
Yes	67	63.8
No	38	36.2
Wound wash		
Water only	29	27.6
Soap and water	38	36.1
Application of irritants		
Yes	22	20.9
No	83	79.1
Source of treatment		
Government	68	64.7
Private	15	14.2
Traditional healers	17	16.2
RHTC and others	5	4.9
Vaccine given		
Yes	74	70.4
No	31	29.6
Number of doses of vaccine		
<3	51	48.5
>3	23	51.5
RIGs		
Given	4	3.8
Not given	101	96.2

in a hospital based study reported similar findings. This risk can be reduced by teaching young children on how to behave with dogs which can help in changing their behaviour and studies in school children and preschool children have shown that school education programs on preventing dog bites can alter their behaviour towards dogs.^[13] Eighty percent of cases belong to low socioeconomic status and Sudarshan^[4] reported similar findings.

Almost 78% of bites are unprovoked which was higher when compared with the studies by Behera et al.^[14] and Icchapujani et al.^[15] in which they found unprovoked bites in 56.6% and 64.3% cases, respectively. Lower limb is the most common site of bite similar to other studies.^[10,11] In the present study, 5% of bites were in head and neck and Kale et al.^[11] reported almost 15% cases having injuries in face, head, and neck. Hospital based studies indicate most of the bites are common in face, head, neck, and upper limb contrary to this study. When compared to adults, head and neck bites are common in children due to proximity of child face to dogs

which increases the likelihood of injuries.^[16] This difference may be because most of the minor bites were treated in the community itself. The most common place of bite is in around house with familiar dogs in 70% of victims. These bites can be prevented by careful monitoring of parents and care givers.

In the present study, 64% of dog bite victims did wash their wounds and among those who washed only 36% used soap and water for washing their wounds immediately following dog bite. In a nationwide study, Sudharshan^[4] also reported wound treatment was done only in 40% of cases. Irritants such as turmeric paste, chilli powder, ink were applied in 21% of cases. Almost 80% of victims accessed either government or private facilities for treatment. In 70% of cases vaccine was given which is higher than that of some Indian studies. This may be increased awareness about usage of anti rabies vaccine in dog bite cases among people and availability of vaccine in PHC. The life saving measure of RIGS was given in 4% of cases which may be due to non availability of RIGS in PHC and cost. This indicates awareness and accessibility to vaccines is increased but there is a need for health education programs about local wound treatment and indigenous practices.

Conclusion

In conclusion, period prevalence of dog bites is high and it is common in children belonging to poor socioeconomic conditions. Most of the bites happen in and around the house which can be prevented. Development of dog bite prevention program as a part of school health program can increase awareness. Proper wound care was poor and they primarily depend on government facilities for vaccine treatment. Indigenous use irritants are common but use of life saving RIGS is low. In a country with very high population of unvaccinated dogs, health education program focusing on prevention of dog bites, correct methods of local wound treatment, vaccine, and rabies immunoglobulins are needed.

Acknowledgement

We acknowledge the management of Sri Manakula Vinayagar Medical College and Hospital, Puducherry for funding this research.

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How to cite this article: Venkatesan M, Dongre A, Ganapathy K. A Community based cross sectional study of dog bites in children in a rural district of Tamil Nadu. *Int J Med Sci Public Health* 2017; 6:109-112

Source of Support: Nil, **Conflict of Interest:** None declared.