Original Article

Treatment compliance of self-reported dog bite cases attending outpatient department of Tertiary Care Hospital, Maharashtra

Abstract

Objectives: To assess treatment compliance of self-reported dog bite cases and to assess associated demographic and exposure factors. **Materials and Methods:** The present prospective study was conducted during January 2013 to July 2013 among 260 dog bite cases by purposive sampling at the outpatient department of a tertiary hospital. After obtaining verbal informed consent, a predesigned questionnaire was used. The assessment of treatment compliance of postexposure prophylaxis (PEP) regimen was considered on the basis of intramuscular anti-rabies vaccine (ARV) regimen by classifying completed PEP and defaulted PEP. At the end of PEP regimen of every participant, we obtained information about received ARV doses using telephone survey method. Data were analyzed using statistical software Epi info Version 7. **Results:** Of 260 dog bite cases, 76.5% cases were completed PEP. The majority, 22.3% cases from age group ≤10 years, 56.2% males, 48.1% from urban area, 25% had primary school education, 32.7% students, 53.8% had bite mark on lower limb, 58.5% were category III exposure, and 70.8% who had received previously immunization against rabies, were completed PEP. The bite due to 54.6% pet dog, 58.1% observable dog, 40% provoked bite, 71.9% cases who had not known about the rabid status of the dog, were completed PEP. The unconditional logistic regression analysis found that demographic and exposure factors were not independently associated with treatment compliance ($P > 0.05$) except literacy status ($P < 0.05$). The present study showed maximum completed PEP cases, however, it showed the demographic and exposure factors of dog bite cases were not independently associated with treatment compliance except literacy status.

Key words: Completed postexposure prophylaxis, defaulted postexposure prophylaxis, dog bite cases, outpatient department, treatment compliance

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Access this article online

Website: www.ijmedph.org

DOI: 10.4103/2230-8598.165954

Quick response code:

INTRODUCTION

Human rabies is endemic in India.[1-3] Rabies virus is usually transmitted by the bite of an infected animal or contamination of broken skin by saliva.[4] The dog is the principal reservoir of rabies in India. Over 95% of human deaths due to rabies are caused by dog bites.[5,6] Prevention of rabies is possibly by providing the exposed person with the proper postexposure prophylaxis (PEP), PEP in rabies exposed persons includes wound toilet, postexposure vaccination, and administration of rabies immunoglobulin.[7,8] At the global level, more than 15 million people receive rabies prophylaxis annually, majority of whom live in China and India. It is estimated that in the absence of PEP about 327,000 persons would die from rabies in Africa and Asia each year.[9] At the dawn of 21st century,

How to cite this article: Domple VK, Doibale MK, Sonkar VK, Aswar NR, Khadilkar HA, Jain SR. Treatment compliance of self-reported dog bite cases attending outpatient department of Tertiary Care Hospital, Maharashtra. Int J Med Public Health 2015;5:297-300.

we have achieved treatments progress in many spheres including science and technology, information technology, agriculture, satellite communication, etc. Unfortunately, we still have the highest number of deaths due to rabies, ironically a disease preventable by modern prophylactic measures.[10] The reasons given for not reporting, completing, or adhering to PEP include poor awareness about the danger of the disease, small size of the injury, reluctance of the dog owner to pay for treatment costs, and not being advised to take PEP. Rabies remains a neglected disease in terms of policy formulations throughout most of the developing countries.[11] Among the various measures recommended for rabies control in dogs such as control of stray dogs and mass education, vaccination constitutes the most effective way to interrupt the rabies transmission cycle.[12]

Literature search regarding the same issue showed that very few studies[11-16] was conducted. Keeping in mind, the public health scenario of rabies, this study was undertaken to assess treatment compliance of self-reported dog bite cases and to assess associated demographic and exposure factors.

MATERIALS AND METHODS

The present prospective study was conducted during January 2013 to July 2013 at immunoprophylaxis center and anti-rabies vaccination center (IPC and ARV) of Shri Guru Gobind Singhji Memorial Hospital, a Tertiary Care Hospital which is attached with the Dr. Shankarrao Chavan Government Medical College, Nanded. The 260 dog bite cases were included in our study by purposive sampling. The cases were included in our study who had the telephone facility (either landline or mobile) and who had not any telephone facility, they were excluded. A pretested and predesigned questionnaire was used to elicit the required data pertaining to age, sex, residence (urban/rural), literacy status, occupation, type of dog (pet/stray, observable/nonobservable, provoked/nonprovoked, rabid status of dog), site of dog bite marks, diagnosis of bite, status of previously immunized against rabies of cases etc., by interviewing. The assessment of treatment compliance of PEP regimen was considered on the basis of ARV regimen (intramuscular injection of ARV on 0, 3, 7, 14, 28 days). The person, who had received all recommended doses of ARV, was considered as completed PEP and who did not receive all recommended doses, was considered as defaulted PEP. Verbal informed consent of all participants was sought after duly informing them about the study.

Protocol for dog bite case management in our hospital

Once the case presented to outpatient department (OPD), he or she was advised about the local treatment of wound (thorough cleaning under tap water and keeping wound open etc.), ARV dosages as per category of wound, anti-rabies serum for all class three bites and injection TT as per the Guidelines for the PEP by the WHO[9] and treated accordingly in our OPD. Patients who took treatment were from Nanded city, Nanded district (urban and rural) and from adjacent districts. After experts' advice, of these cases, few wished to follow the same schedule at their native places from government health facilities and remaining continued treatment and received remaining doses of ARV at our OPD.

After the completion of ARV schedule, the cases were contacted telephonically to receive the data regarding the ARV doses using telephone survey method.[17] Data were tabulated and analyzed using statistical software Epi info Version 7 (Atlanta, Georgia, USA) by maintaining confidentiality for percentages, unconditional logistic regression.

RESULTS

Thus, we had followed 260 dog bite cases. The majority, 30.8% of dog bite cases were from ≤10 years age group. The median age was 20 and mean ± standard deviation was 23.46 ± 17.82. The similar percentages, 21.2% of dog bite cases were from 11 to 20 and 21 to 30 years age group. Only 11 cases were from 41 to 50 years age group. The distribution by sex regarding dog bite cases was more in males (73.8%) in comparison with 26.2% females. The bulk of dog bite cases were from the urban area (63.8%) than the rural area (36.2%). The 32.7% dog bite cases had primary school education followed by 21.5% were illiterate. The occupation profile of dog bite cases showed that 43.8% were student, 13.1% were labor, 12.7% were having job, and so on. We found the most commonly site of bite marks was 70.4% lower limb in contrast to 25% upper limb. The maximum dog bite cases, 78.5% were category III exposure than 21.5% category II exposure. Only 8.1% cases had received previously immunized against rabies cases.

The cases were bitten by 70.4% pet dogs while the remaining by 29.6% stray dogs. In 73.5% cases, dogs were observable whereas, in 26.5% cases, dogs were nonobservable. The bite was provoked in 52.3% cases and unprovoked in 47.7% cases. The rabid status of dog was suspected in 7.3% cases and not known in 92.7% cases.

Of 260 dog bite cases, 76.5% cases were completed PEP as compared to 23.5% were defaulted PEP. The majority, 22.3% cases from age group ≤10 years, 56.2% males, 48.1% from urban area, 25% had primary school education, 32.7% students, 53.8% had bite mark on lower limb, 58.5 were category III exposure and 70.8% who had received previously immunization against rabies, were completed PEP. The maximum number of cases, bite due to 54.6% pet dog, 58.1% observable dog, 40% provoked bite, 71.9% cases who had not known about the rabid status of dog, were completed PEP [Table 1].

The unconditional logistic regression between demographic and exposure factors and treatment compliance to PEP with ARV vaccine among dog bite cases showed nonsignificant results for all dependent variables ($P > 0.05$) except literacy status of dog bite cases, which was found to be independently associated with treatment compliance to PEP ($P < 0.05$) [Table 2].

DISCUSSION

The present study was carried out to assess treatment compliance of self-reported dog bites cases and to assess associated demographic and exposure factors in our hospital.

Table 1: Profile of self-reported dog bite cases

Variables	Defaulted PEP	Completed PEP
Age (years)		
≤10	22 (8.5)	58 (22.3)
11-20	13 (5.0)	42 (16.2)
21-30	16 (6.2)	39 (15.0)
31-40	04 (1.5)	29 (11.2)
41-50	01 (0.4)	10 (3.8)
51-60	01 (0.4)	11 (4.2)
>61	04 (1.5)	10 (3.8)
Sex		
Female	15 (5.8)	53 (20.4)
Male	46 (17.7)	146 (56.2)
Residence		
Rural	20 (7.7)	74 (28.5)
Urban	41 (15.8)	125 (48.1)
Literacy status		
Illiterate	19 (7.3)	37 (14.2)
Primary	20 (7.7)	65 (25.0)
Middle	05 (1.9)	30 (11.5)
High school	08 (3.1)	43 (16.5)
Intermediate	02 (0.8)	09 (3.5)
Graduate	06 (2.3)	13 (5.0)
Professional	01 (0.4)	02 (0.8)
Occupation		
Housewife	04 (1.5)	17 (6.5)
Business	03 (1.2)	09 (3.5)
Labor	08 (3.1)	26 (10.0)
Farmer	06 (2.3)	24 (9.2)
Student	29 (11.2)	85 (32.7)
Job	05 (1.9)	28 (10.8)
Dependent	06 (2.3)	10 (3.8)
Site of bite marks		
Head or face	0 (0)	05 (1.9)
Upper limb	16 (6.2)	49 (18.8)
Lower limb	43 (16.5)	140 (53.8)
Trunk	0 (0)	03 (1.2)
Multiple sites	02 (0.8)	02 (0.8)
Diagnosis		
Category II	09 (3.5)	47 (18.1)
Category III	52 (20.0)	152 (58.5)
Status of previously immunized cases against rabies		
No	55 (21.2)	184 (70.8)
Yes	06 (2.3)	15 (5.8)
Whether dog was a pet or stray?		
Stray	20 (7.7)	57 (21.9)
Pet	41 (15.8)	142 (54.6)
Whether the dog was observable or nonobservable?		
Nonobservable	21 (8.1)	48 (18.5)
Observable	40 (15.4)	151 (58.1)
Whether the bite was provoked or unprovoked?		
Provoked	32 (12.3)	104 (40.0)
Unprovoked	29 (11.2)	95 (36.5)
Rabid status of dog		
Not known	54 (20.8)	187 (71.9)
Suspected	07 (2.7)	12 (4.6)
Total	61 (23.5)	199 (76.5)

PEP = Postexposure prophylaxis

Most of the studies related to treatment compliance to rabies PEP are retrospective studies like that by Mazigo *et al.*,[11] Aworh *et al.*,[12] Bocsan *et al.*,[13] and Kubheka *et al.*[14] After extensive research, we could find only one prospective study by Shankaraiah *et al.*[16] about treatment compliance with which could relate the findings of the current study.

Our study findings suggested that majority of cases completed PEP (76.5%) than defaulted PEP (23.5%). In the prospective study, on treatment compliance of PEP following dog bite by Shankaraiah *et al.*,[16] the compliance rate for the full course of intramuscular ARV was 60%. The reasons of defaulted PEP could be as asymptomatic person while receiving PEP may be due to varying incubation period, low prevalence of rabies, the irregular regimen which was not on continuous days (Intramuscular Regimen - 0, 3, 7, 14, 28 days), lack of awareness among masses that the rabies is potentially incurable and is only preventable.

In our study, the majority of dog bite cases were males (73.8%) and from ≤10 years age group (30.8%). Similarly, majority of the bite victims were males (65.1%), and most of them were aged below 15 years (41.4%) in the study by Shankaraiah *et al.*[16] These findings were consistent with other retrospective studies on dog bite cases by Behera *et al.*[2] (71.3% males and 40.5% children <15 years of age) and Aworh *et al.*[12] (52.9% children <15 years of age).

The maximum dog bite cases (78.5%) were category III exposure than 21.5% category II exposure and the most common site of bite marks was 70.4% lower limb, similar to the study by Shankaraiah *et al.*[16] (87.5% on the limbs and 79.0% had category III exposure) and Kubheka *et al.*[14] (72% on lower limbs and slightly lower category III exposure, 43.3%). Of the dogs implicated for human bites, maximum were pet dogs (70.4%) in our study in contrast to the study by Aworh *et al.*[12] (52.7% were stray dogs).

Unconditional logistic regression of demographic and exposure factors with dog bite cases revealed that only literacy status of the dog bite cases was significantly associated with treatment compliance to PEP of ARV vaccine ($P < 0.05$). Rest all the variables did not show any significant association ($P > 0.05$).

The strength of our study was that it was prospective in nature, and not much prospective studies were available to assess the association of demographic and exposure factors with treatment compliance. The major limitation of this study was small sample size which may preclude the statistical significance and being hospital-based study, the cases were self-reported dog bite cases so denominator of dog bite cases could not be determined. The results could not be generalized as those who had no telephonic connection were excluded. Further community-based study is needed with large sample size which would suggest statistical significance for association.

Table 2: Unconditional logistic regression between demographic and exposure factors and compliance of ARV vaccine as PEP prophylaxis among dog bite cases

Variables	OR	95% CI		*P*
		Upper	Lower	
Age	1.4053	0.6908	2.8586	0.3477
Sex	1.4507	0.6974	3.0178	0.3195
Residence	0.7478	0.3861	1.4483	0.3889
Literacy status	2.3244	1.0150	5.3229	0.0460
Occupation	1.3084	0.3233	5.2957	0.7063
Site of bite marks	0.8631	0.4589	1.6230	0.6476
Diagnosis	0.5893	0.2592	1.3399	0.2070
Status of previously immunized cases against rabies	0.8152	0.2909	2.2842	0.6975
Whether the dog was a pet or stray?	0.7739	0.3302	1.8141	0.5554
Whether the dog was observable or nonobservable?	1.6107	0.7082	3.6634	0.2556
Whether the bite was provoked or unprovoked?	0.8321	0.4410	1.5701	0.5705
Status of rabies of dog	0.5129	0.1577	1.6678	0.2671

OR = Odds ratio, CI = Confidence interval, ARV = Anti-rabies vaccine, PEP = Postexposure prophylaxis

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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