Research Article

Epidemiology of animal bite cases reported to anti-rabies vaccination OPD at a tertiary-care hospital, Nagpur

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Abstract

Background: Rabies is a fatal viral zoonosis and serious public health problem. It is 100% fatal yet 100% preventable disease. This article discusses epidemiological characteristics of animal bite cases and the attitude and practices among the study population.

Objective: To study the epidemiology of animal bite cases reported to anti-rabies vaccination (ARV) outpatient department (OPD), at a tertiary-care hospital, Nagpur.

Materials and Methods: This cross-sectional study was carried out at ARV OPD under the Department of Community Medicine, Indira Gandhi Government Medical College, a tertiary-care hospital, Nagpur, Maharashtra, India, during the period from May 1, 2015 to October 31, 2015. All the new cases of animal bites reported to ARV OPD during the period were interviewed using semistructured pro forma. Data were presented using percentages and proportions.

Result: About 70.6% animal bite cases were male subjects when compared with 29.4% female subjects. About 19.8% animal bites occurred in children up to 10 years of age and 2.3% in persons over 70 years of age. About 89.4% animal bites were from urban area and 10.6% from rural area. Dog was the most common (96.2%) biting animal, followed by cat, monkey, pig, and goat. About 56.7% were unprovoked bites and 43.3% provoked bites. About 61% had category II bite, followed by category III (35%) and category I (4%). Maximum (i.e., 40%) of cases was reported within 24–48 h of bite. First aid treatment was received by 63.3% subjects, while 36.7% victims did no management before coming to ARV OPD.

Conclusion: The dog is the main biting animal affecting most of the victims, mostly children and working population. The pretreatment management of wound was not proper; so, community should be made aware of local wound management and use of modern antiserum and tissue culture vaccine as post exposure prophylaxis.

KEY WORDS: Animal bite, provocation status, time of reporting, pretreatment practice

Introduction

Rabies is a fatal viral zoonosis and serious public health problem. It is 100% fatal yet 100% preventable disease. It is reported that the Southeast Asia region accounts for roughly 60% of human deaths owing to rabies in the world.[1] In India alone, rabies causes an estimated 20,000 deaths, with 17.4 million exposures to animal bite occurring every year.[2] Thus, the burden of the disease in India comes around two per lakh population and is substantial. The data can be even greater as the illness is neither reported nor notified. It is expected that, in the absence of the postexposure prophylaxis, about 327,000 people would expire from rabies each year just in Asia and Africa.[3]

The disease is communicated to humans through contact, chiefly bites and scratches with diseased animals, both domestic and wild.[4] Dogs and cats are a principle reservoir of

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rabies and play an important role in transmission of the disease.[5] There are several myths and false beliefs connected with the wound management. This includes application of oil, turmeric, salt, herb, lime, and red chilli on wound inflicted by rabid animal. These vary from region to region, and they determine the postexposure treatment looking for behavior of animal bite victims.[6]

As very few studies have been conducted in the area, this study was carried out with the objectives of knowing the epidemiology of animal bite cases and attitude and practices adopted by the patients after exposure to animal bites.

Materials and Methods

This cross-sectional study was carried out in the Anti-Rabies Vaccination (ARV) outpatient department (OPD) under the Department of Community Medicine, Indira Gandhi Government Medical College, a tertiary-care hospital, Nagpur, Maharashtra, India, during the period from May 1, 2015 to October 31, 2015.

All the new cases of animal bites reported during the period were included in the study. A total of 987 animal bite cases reported for treatment in this OPD during the study period were studied and analyzed. The variables studied were age, sex, residence, time of reporting, and measures taken after bite.

Classification of exposure was done as per the WHO classification. A bite was considered as provoked if it had resulted from the subject initiating the interaction with the animal such as playing with dog or annoying the dog during his meal.

Statistical Analysis

Percentages and proportions were used as statistical tools.

Result

A total of 987 victims of animal bites reported at the ARV OPD during the study period. Of these, majority of the animal bite cases was male subjects (70.6%) when compared with female subjects (29.4%). Animal bites occurred in all age groups, but children were more vulnerable to it. Majority of animal bites (19.8%) occurred in children up to 10 years of age and least in persons older than 70 years of age (2.3%). Around 89.4% animal bite victims were from urban area while remaining 10.6% from rural area [Table 1].

Dog was the most common (96.2%) biting animal, followed by cat (1.7%). Patients with bites of monkey, pig, and goat were also reported. Of 987, unprovoked bite was seen in majority of cases [i.e., 559 (56.7%)]; however, 428 (43.3%) cases reported from provoked bite [Table 2].

Majority [i.e., 600 (61%)] had category II bite, followed by category III [348 (35%)] and category I [39 (4%)] [Figure 1].

Maximum (i.e., 40%) cases were reported within 24–48 h of bite, followed by 26.7% on third day. Only 10% cases were reported within 24 h of bite. Around 3.3 % cases were reported after 5 days of bite [Table 3].

First aid treatment was received by 63.3% subjects, while 362 (36.7%) victims did no management before coming to ARV OPD. Washing wound with water was practiced by 3.3% of patients, while soap and water was used by only 66 (6.7%) victims. Other first aid treatment practices were application of turmeric and oil (23.3%), antiseptics (16.6%), and salt by 13.4 patients [Table 4].

Discussion

In this study, male subjects were exposed more (70.6%) to animal bites than females. This finding may be because that men were more likely to go out of their homes for work when compared with females.[7–10] About 19.8% cases of animal bite occurred in children up to 10 years of age, and nearly half of the cases occurred in persons of economically productive age group. The incidence of animal bites decreased with increasing age. Tiwari et al.,[11] Shetty et al.,[12] and Rambhau and Dilip[13] also found similar trends. Children's small size may encourage a dog to act dominantly toward them. Children do not recognize the angry or defensive behavior of the dogs and continue to play with them, which the dogs consider as the invasion of territory and may incite an attack.[8] Many children lack the judgement about how to deal with a dog, and their inability to fend off an attack may put them at additional risk.[14]

In the study, 89.4% of the victims were from urban and remaining 10.6% from rural areas. This may be because many cases were reported to primary health centers where ARV was available. More animal bites from rural areas were reported by Modi[15] and Behera et al.,[9] while Sampath[16] found more cases from urban area.

About 61% of the animal bites were of category II, followed by category III (35%).[11,15]

Dog as a major biting animal (96.2%) was found in this study, and other studies also agree with this finding.[11,17–19]

In our study, the reporting time to the clinic varied from within 24 h to > 5 days and 50% reported within two days. Behera et al.[9] and Shetty[12] also found similar findings. However, around 3.3% patients reported after 5 days of bite, which shows casual attitude of patient toward animal bite.

Local wound treatment, that is, immediate flushing and washing the wounds, scratches, and adjoining areas with plenty of soap and water, preferably under a running tap for at least 5 min and irrigation with virucidal agents can reduce the chances of developing rabies by up to 80%.[20]

In this study, around 36.7% cases did not receive any kind of first aid treatment. Among those who received first aid treatment, 3.3% used water, 6.7% used soap and water, while 16.6% applied antiseptic creams over wound. However, remaining 36.7% of patients had done the first aid in the form of application of oil, salt, lime, and turmeric powder which has

Table 1: Sociodemographic characteristics of study subjects

Sociodemographic characteristics	Male, *N* = 697, *n* (%)	Female, *N* = 290, *n* (%)	Total, *N* = 987, *n* (%)
Age (years)			
0–10	124 (17.8)	72 (24.8)	196 (19.8)
10–20	143 (20.5)	51 (17.6)	194 (19.6)
20–30	154 (22.0)	36 (12.4)	190 (19.2)
30–40	82 (11.8)	35 (12.1)	117 (11.8)
40–50	76 (10.9)	44 (15.2)	120 (12.2)
50–60	54 (7.7)	18 (6.2)	72 (7.4)
60–70	49 (7.0)	27 (9.3)	76 (7.7)
70–80	15 (2.2)	7 (2.4)	22 (2.3)
Residence			
Urban	624 (89.5)	259 (89.3)	883 (89.4)
Rural	73 (10.5)	31 (10.7)	104 (10.6)

Table 2: Factors related to animal bite in study subjects

Factor	Number	Percentage
Type of animal (*N* = 987)		
Dog	949	96.2
Cat	17	1.7
Monkey	14	1.4
Pig	6	0.6
Goat	1	0.1
Provocation status (*N* = 987)		
Provoked	428	43.3
Unprovoked	559	56.7

Table 3: Time of reporting to ARV OPD after animal bite

Time	Number (*N* = 987)	Percentage
<24 h	99	10
24–48 h	395	40
Third day	263	26.7
Fourth day	132	13.3
Fifth day	65	6.7
>Fifth day	33	3.3

Table 4: Immediate treatment of animal bite in study subjects

Factor first aids	Number (*N* = 987)	Percentage
Washed with water only	33	3.3
Washed with soap and water	66	6.7
Antiseptic	164	16.6
Turmeric and oil	230	23.3
Salt	132	13.4
None	362	36.7

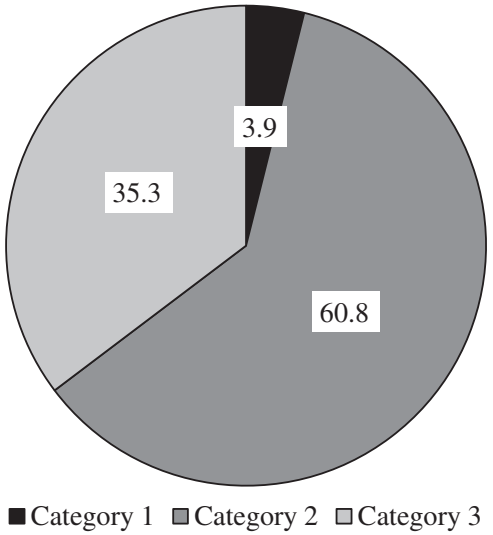

Figure 1: Classification of exposure.

no value as a first aid or even these practices may damage the nerve ending and favor the virus entry in nerves.[6,13,9,21] This study and studies conducted by Rambhau and Dilip,[13] Behera et al.,[9] and Khokhar et al.[21] found that washing the local wound with water and soap as a first aid treatment were practiced to a lesser extent.

Conclusion

The dog is the main biting animal affecting most of the victim, mostly children and working population. The pretreatment management of wound was not proper; so, community should be made aware of local wound management and use of modern antiserum and tissue culture vaccine as post exposure prophylaxis.

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