Title: DOG-BITE CASES IN THE TVC, KHANAPARA– A RETROSPECTIVE STUDY

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Abstract

Rabies remains an under-reported neglected fatal zoonoTIc viral disease with almost a cent per cent case fatality rate in animals and humans, contradictory to the disease being 100 per cent preventable with TImely administraTIon of Rabies Immunoglobulin (RIG) and Post Exposure Prophylaxis (PEP). A five-year (2013-2017) retrospecTIve study of dog-bite cases presented to the Teaching Veterinary Clinics, College of Veterinary Science, Khanapara, GuwahaTI was undertaken. Of the 654 cases, only 635 cases belonging to di erent animal species of both the sexes and varying age were analysed. The highest incidence was recorded during 2016 followed by 2017 and 2015. Male animals had a higher incidence (53.2; 68.4%) than the females (27.1; 43.6%). The various a ected species were avian, bovine, canine, caprine, feline, guinea pig, leporidae, monkey, rodent and swine. The highest bite cases were recorded in the canine and caprine species

Introduction

Before the advent of agriculture and permanent human seTTlements, over 15,000 years ago, man domesTIcated dogs - Canis lupus familiaris descended from the grey wolves - Canis lupus [1, 2]. Since that TIme, the bond between man and dog has lasted for several thousands of years shaping the way human brains developed. These canine companions e ected man in many surprising ways, from boosTIng the immune system to staving o demenTIa. It is no wonder that they have been regarded as 'Man's best friend' [3].

In spite of the long associaTIon, dogs pose a threat to man through socially unacceptable or dangerous behaviour like aggression and pose a risk to public safety by dog- bite which has been acknowledged by the Society for PrevenTIon of Cruelty to Animals (SPCA) [4]. Dogs act as carriers of various zoonoTIc diseases, of which rabies is mostly transmiTTed by bite wounds. In a mulTI-centric study in 2003, the annual human deaths due to rabies was esTImated at 20,565, of which more than 95 per cent cases recorded street dogs as the source of infecTIon [5]. Public educaTIon about rabies, implementaTIon of canine vaccinaTIon and populaTIon management of dogs play a key role in the prevenTIon of rabies [6]. Deaths mostly occurred due to ignorance about the urgency of wound management and delay in administering the first dose of anTI-rabies vaccine within 24 hours of bite [7].

Approximately 1.1 to 1.5 million people received post-exposure prophylacTIc treatment against 2 million bite cases annually in India, more than 95 percent of which were caused by dogs [8]. Although a large number of animals and birds also are biTTen by dogs every year, the esTImate of the casualTIes were unavailable due to lack of reporTIng by the a ̄ected owners and record keeping by the veterinary pracTITIoners. Awareness campaign about rabies as well as the importance of PEP to save livestock and human is immediately warranted in this situaTIon.

The Teaching Veterinary Clinics (TVC), College of Veterinary Science, AAU, Khanapara, GuwahaTI receives various cases requiring treatment, including dog-bite cases for PEP. Majority of the bite cases are caused by dogs and the rest by other animals. Dogs have a natural tendency to bite when they are defensive or protecTIve and when they are in the proximity of other species

Materials and Methods

ETHICAL STATEMENT

The study was conducted aŌer approval from InsTItuTIonal Animal Ethics CommiTTee (IAEC), AAU, Khanapara, vide approval no. 770/ac/CPCSEA/FVSc/AAU/ IAEC/17-18/526 Dated 09.08.2017

LOCATION OF WORK

The study was carried out in the Department of Veterinary Epidemiology & PrevenTIve Medicine, College of Veterinary Science (CVSc), Assam Agricultural University (AAU), Khanapara, GuwahaTI-781 022, in collaboraTIon with:

a) Teaching Veterinary Clinics (TVC), CVSc, AAU, Khanapara, GuwahaTI-781 022, and

b) Department of Livestock ProducTIon & Management (StaTIsTIcs and Data Analysis), CVSc, AAU, Khanapara, GuwahaTI-781 022

RESEARCH QUESTION

1. Is there any incidence of dog-bite cases in animals presented to the TVC, CVSc, AAU, Khanapara, GuwahaTI-781 022?

SECONDARY DATA COLLECTION

Data of the past five years (2013-2017) on dog-bite cases were collected from the records maintained in the Teaching Veterinary Clinics (TVC) for retrospecTIve analysis.

STATISTICAL ANALYSIS PLAN

The collected data were fed in MS-Excel which served as the master table for the study. StaTIsTIcal analysis was done using soŌware JMP 10 of SAS 9.3 (SAS Inc.) available at the BiostaTIsTIcs Unit in the Department of Livestock ProducTIon and Management, College of Veterinary Science, Khanapara, GuwahaTI-781 022

Exprimental Findings

DOG-BITE CASES REPORTED TO THE TVC: A RETROSPECTIVE ANALYSIS

The frequency of dog-bite cases reported in the TVC, CVSc, AAU, Khanapara during the period (2013-2017) is shown in Table 1. A total of 654 dog-bite cases in various species were presented for PEP.

TABLE 1. MONTH-WISE FREQUENCYOF DOG-BITE CASES PRESENTED TO THE TVC (2013-17)

Month	Year					Total
	2013	2014	2015	2016	2017	
January	2 (2.1)	7 (5.3)	1 (0.7)	12 (8.1)	10 (7.1)	32 (4.9)
February	2 (2.1)	13 (9.8)	13 (9.5)	22 (14.8)	0 (0.0)	50 (7.6)
March	5 (5.3)	4 (3.0)	14 (10.2)	21 (14.1)	16 (11.3)	60 (9.2)
April	1 (1.1)	12 (9.0)	9 (6.6)	1 (0.7)	12 (8.5)	35 (5.4)
May	5 (5.3)	14 (10.5)	11 (8.0)	27 (18.1)	11 (7.8)	68 (10.4)
June	15 (16.0)	15 (11.3)	14 (10.2)	11 (7.4)	10 (7.1)	65 (9.9)
July	13 (13.8)	23 (17.3)	14 (10.2)	7 (4.7)	9 (6.4)	66 (10.1)
August	10 (10.6)	9 (6.8)	14 (10.2)	17 (11.4)	8 (5.7)	58 (8.9)
September	13 (13.8)	8 (6.0)	11 (8.0)	0 (0.0)	8 (5.7)	40 (6.1)
October	9 (9.6)	8 (6.0)	15 (10.9)	13 (8.7)	26 (18.4)	71 (10.9)
November	14 (14.9)	13 (9.8)	8 (5.8)	11 (7.4)	14 (9.9)	60 (9.2)
December	5 (5.3)	7 (5.3)	13 (9.5)	7 (4.7)	17 (12.1)	49 (7.5)
Total	94 (100)	133 (100)	137 (100)	149 (100)	141 (100)	654 (100)

Figures within parentheses indicate % within the year

The highest incidence of dog-bite cases in animals was recorded during 2016 (149), followed

by 2017 (141) and 2015 (137).

The gender frequency of the dog-bite cases during 2013-17 is shown in Table 2.

TABLE 2: GENDER FREQUENCY OF DOG-BITE CASES PRESENTED TO THE TVC (2013-2017).

Year	Sex not recorded	F	M	Total
2013	3 (3.2)	41 (43.6)	50 (53.2)	94 (100)
2014	6 (4.5)	36 (27.1)	91 (68.4)	133 (100)
2015	4 (2.9)	42 (30.7)	91 (66.4)	137 (100)
2016	2 (1.3)	47 (31.5)	100 (67.1)	149 (100)
2017	4 (2.8)	53 (37.6)	84 (59.6)	141 (100)
Total	19 (2.9)	219 (33.5)	416 (63.6)	654 (100)

Figures within parentheses indicate % within the year; Chi Sq=11.09, df=8, P=.197

Of the 654 cases only 635 cases were analysed gender-wise due to lack of informaTIon on the gender in 19 cases. The analysis showed that 33.5 (27.1-43.6%) percent bite cases occurred in female animals which was lower than that of males being 63.6 (53.2-68.4%) percent annually.

Dog-bite cases in both the genders of various species presented to the TVC during 2013-2017 is shown in Table 3.

Figure 1 and Table 3 depicts the average age of dog-bite cases brought to the TVC being 2.48 years (SD=2.446, n=613). However, 41 cases as per the available record did not indicate age.

TABLE 3: SPECIES AND SEX-WISE FREQUENCY OF DOG-BITE CASES PRESENTED TO THE TVC (2013-2017)

Species	Sex				Age in Years (Mean± SD; n)
	Not recorded	Female	Male	Total	
Avian	6 (85.7)	0 (0.0)	1 (14.3)	7 (100)	0.65±0.49, n=2
Bovine	0 (0.0)	7 (70.0)	3 (30.0)	10 (100)	1.39±1.47, n=9
Canine	6 (1.2)	127 (25.2)	370 (73.6)	503 (100)	2.72±2.56, n=485
Caprine	1 (1.0)	76 (72.4)	28 (26.7)	105 (100)	1.84±1.79, n=94
Feline	3 (16.7)	5 (27.8)	10 (55.6)	18 (100)	0.97±1.37, n=15
*Guinea pig	1 (100)	0 (0.0)	0 (0.0)	1 (100)	-
Leporidae	2 (40.0)	2 (40.0)	1 (20.0)	5 (100)	0.43±0.12, n=3
Monkey	0 (0.0)	1 (100.0)	0 (0.0)	1 (100)	0.3±, n=1
Rodent	0 (0.0)	0 (0.0)	1 (100)	1 (100)	0.4±, n=1
Swine	0 (0.0)	1 (33.3)	2 (66.7)	3 (100.0)	0.3±0.1, n=3
	19 (2.9)	219 (33.5)	416 (63.6)	654 (100.0)	2.48±2.45, n=613

Figures within parentheses indicate % within a species

*Age and sex were not recorded

The various aTected species were avian (7), bovine (10), canine (503), caprine (105), feline (18), guinea pig (1), leporidae (5), monkey (1), rodent (1) and swine (3). Of all the species, highest cases were recorded in canine and caprine.

InformaTIon on gender in 19 cases was not available. Of the remaining cases (N=635), the highest bite cases were recorded in dogs (503; 73.6%) and does (105; 72.4%). Gender- wise, more dogs than bitches and does than bucks received dog-bites.

Discussions

DOG-BITES REPORTED TO THE TVC DURING 2013-2017: A RETROSPECTIVE ANALYSIS

The purpose of the five-year retrospecTIve study was to ascertain the incidence of dog- bite cases in animals presented to the TVC that highlighted the risk of rabies in the aTected animals. This also reflected the awareness among the pet and livestock owners regarding administraTIon of PEP to prevent rabies.

A total of 654 dog-bite cases (Table 1) reported to the TVC, of which only 613 and 635 cases could be analysed for esTImaTIon of average age and sex of the species due to non-availability of data in 41 and 19 cases, respecTIvely. Lack of proper case recording in animals was a limitaTIon in esTImaTIng the age and sex-wise dog-bite incidences. Sudarshan (2005) [9] while studying dog-bites cases in human also observed that there was no organized system of surveillance, and hence there was a dearth of reliable data.

In the present study, the average age of dog-biTTen animals were 2.48 years (SD=2.446, n=613). Although no reports on age-suscepTIbility to dog-bite in animals was available, it could be inferred that the age had a good bearing on the exposure to dog-bites in the cases of free ranging animals of young age being more acTIve and vigorous as well as curious to a great extent, leaving much scope for interacTIon with dogs.

Gender-wise, the canine species showed a higher incidence in dogs (370; 73.6%) than in bitches (127; 25.2%) (Table 2 & 3). On the other hand, amongst caprine, the does (76; 72.4%) suTered more dog bites than the bucks (28; 26.7%), contradicTIng the findings of Dar *et al.* (2014) [4], wherein the highest dog-bite cases were recorded in ovine (56.33%)

followed by bovine species (22.11%), and the most bite cases were recorded in females irrespecTIve of age and species.

As per the present findings, a higher number of dogs rather than bitches exposed to bites might be due to their territorial behaviour and compeTITIon for partners during maTIng

season. Reversibly, a higher percentage of does than the bucks biTTen indicated a higher degree of interacTIon between free-roaming dogs and the grazing/ browsing does. While the bucks aŌer aTTaining a certain age are sent for slaughter, the does are mostly kept for breeding. During grazing or browsing, goats tend to trespass in to others property and may get biTTen by the dog(s) guarding that territory. Besides, a doe always stays on guard and remains near her kids while grazing or browsing and becomes the vicTIm when aTTacked by dogs. The pracTIce of rearing goats (say, a doe) on tether during the culTIvaTIon season also heightens the vulnerability to aTTacks by dogs in the rural areas. It can be inferred from the current study that higher dog-bite cases were dependent on the gender and the species involved, which was in disagreement with Dar *et al.* (2014) [4].

The retrospecTIve study of dog-bite cases in animals during 2013-2017 revealed the highest incidence in the year 2016. The significant correlaTIon of dog-bite cases in that year might be aTTributed to a series of floods that started from July 2016 which was 60 percent heavier than the previous years. The floods a ̄ected more than 1.6 million human lives having to abandon their homes and livestock for safe shelters. The floods also a ̄ected the Pobitora Wildlife Sanctuary and Kaziranga NaTIonal Park where around 300 wild animals were reported to have drowned [10]. The rise in dog bite cases might be implicated to the inundated fringe areas and submerged culTIvaTIon fields, resulTIng in loss or disturbance of the habitat of wild canidae (foxes and jackals) compelling them to share human seTTlement for survival. The free-roaming community dogs in such areas might have come in contact with the displaced wildlife canidae while protecTIng their territory and most likely got biTTen and turned rabid and subsequently aTTacked other animals including livestock in the locality.

India reports the highest casualty due to rabies globally, complicated by absence of organized surveillance system, both in animals and man. Rabid dog-bite morbidity and mortality could not be ascertained from the TVC in the current study owing to various factors chiefly, unorganized maintenance of records. Menezes (2008) [11] observed that the faciliTIes for surveillance and diagnosis of animal rabies must be improved in quality and o ̄er wider

coverage, besides human rabies be declared a mandatory reportable disease similar to the iniTIaTIve taken by Government of Sikkim [12].

Conclusion

Historical data collected from the TVC revealed that during the five-year period (2013-2017) there were a total of 654 dog-bite animal vicTIms. The highest dog-bite cases occurred in the year 2016. The highest incidence was observed in males and females of the canine and caprine

species, respecTIvely. Since no standardized data recording and record keeping system in animals existed, the actual number of dog-bite cases, and morbidity and mortality could not be ascertained from the data obtained.

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