ORIGINAL RESEARCH ARTICLE

"PATTERN AND TRENDS OF ANIMAL EXPOSURE AMONG PATIENTS ATTENDING PREVENTIVE CLINIC DURING COVID19 LOCKDOWN"

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Abstract

BACKGROUND: Rabies is one of the leading cause of deaths worldwide. It has a case fatality rate of almost 100%. it is a zoonotic disease transmitted by the bite of rabid animals. Following an outbreak of the novel coronavirus disease in 2020 a nation wide lockdown was declared in India. Lockdown came into effect in kerala state on 23/03/2020.

OBJECTIVES: The study aimed at finding changes in the patterns of animal bite victims in reporting for treatment during the COVID 19 lockdown as compared to the previous year.

Methods: A record based descriptive study was conducted in a tertiary care center in Thiruvananthapuram city of kerala state in India. Data regarding patients with animal exposure reporting to the anti rabies clinic(preventive clinic) from March 24 2020 and April 30 2020 and similar periods in 2019 were collected for the study. Data was kept confidential and entered into MS Excel and analysed using SPSS 25.

Results and Conclusion: The study results indicate that there is reduction in total number of patients reported during lockdown(N=583) period studied compared to similar periods of previous year(N=832). There was significant increase in accidental animal bites during lockdown (17.4% against 9.5%, 95% CI; OR 1.518 to 2.855), bites to head and neck(8.1% against 4.1%, 95% CI; OR 1.691) probably due to increased exposure to domestic animals and significant reduction in category 2 animal bites reported compared to previous year (13.3% against 21.6%) probably due to neglect of mild injuries which has the potential for rabies in future.

Key words: Animal-bite, rabies, patterns, trends, lockdown

Introduction

Rabies is one of the most deadly infectious diseases, with a case-fatality rate approaching 100%.(1) The disease is established on all continents apart from Antarctica; most cases are reported in Africa and Asia, with thousands of deaths recorded annually. Almost all cases of human rabies result from bites from infected

dogs.(2) In the 21st century, rabies remains as one of the most feared and important threats to public health. As a neglected zoonotic disease, rabies is present throughout much of the world, with many deaths in human beings occurring in Africa and Asia in children younger than 15 years(3). Dogs are the principal vector for human rabies, and are responsible for more than 99% of human cases.(4) Rabies is an incurable viral encephalitis caused by RNA

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viruses of the genus lyssavirus.(5) All mammal species seem to be susceptible to infection, but domestic dogs are the main reservoir of human infection (responsible for 99% of cases)(6). Without rapid prophylaxis after being bitten by an infected animal, the disease has a case-fatality rate of 100% in human beings(6).

Preliminary data suggest that almost 60 000 human deaths occur from rabies globally per year, which is more than that attributed to any other single zoonotic disease.(7) Rabies virus is most commonly transmitted by the bite of a rabid animal. This mechanism enables the virus to transverse the dermal barrier and deposit the virus into tissues in which it can initiate infection.(8) Any penetration of the skin by teeth constitutes a bite exposure. All bites, regardless of body site, represent a potential risk of rabies transmission, but that risk varies with the species of biting animal, the anatomic site of the bite, and the severity of the wound(9).

Due to pneumonia of unknown cause detected in Wuhan, China, which was first reported to the WHO Country Office in China on 31 December 2019, WHO declared the outbreak a Public Health Emergency of International Concern (PHEIC)on 30 January. On 11 March, WHO Director General characterized COVID-19 as a pandemic(10). In India, first case was reported on 29 January 2020, in Kerala, among Wuhan returned students.(11) State wide lock down was announced on 23 March. As more cases appeared across the country, nation-wide lockdown was announced on 24 March 2020.(12)

The health system of Kerala had responded promptly and exemplarily to the threat of this disease by beginning the prevention and control activities days before the confirmation of the first case. Lock down measures were implemented strictly in the state which had considerably decreased incidence of new covid 19 cases in the state. (13) People with animal bites come from Thiruvananthapuram district and adjacent districts for management. Any significant reduction in referral of animal bite cases and not giving proper anti rabies vaccination can result in an increase in the number of potentially untreated patients increasing the risk of future rabies. Same applies for an underreporting of domestic dog bites due to difficulty in getting round and accessing adequate health care facilities due to lack of transportation facilities

(14)This study aims to find out change in pattern of animal exposure cases reaching the preventive clinic of the hospital due to lockdown, probably due to neglect of animal exposures due to travel restrictions and to also to compare present trends with that of the previous year when the lockdown was not in place.

OBJECTIVES

1. To study the pattern of animal exposure among patients attending Preventive clinic at Government Medical College Trivandrum during COVID-19 lockdown in 2020.
2. To compare the pattern of animal exposure during COVID-19 lockdown with previous year 2019.

MATERIALS AND METHODS

A hospital record based descriptive study was done to find out the patterns of animal bite exposure cases reaching to the outpatient department of the preventive clinic during the COVID 19 lockdown which was declared in Kerala from 23 march 2020. The preventive clinic is run by the Department of Community Medicine of Thiruvananthapuram Medical College. It functions round the clock in the hospital which itself is a tertiary care centre catering to a population of over 1 crore spread over 4 districts of the state of kerala.(15) All new patients who reported to the Preventive clinic during the lock down period from 24-3-2020 and 30-4-2020 were included in the study. After getting Institutional Review Board and Institutional Ethics Committee clearance, permission was obtained from the Head of the department and data was collected from the Anti Rabies Vaccination Register of the preventive clinic which records details of animal bite cases reported including the number of cases, name, age, sex, occupation, socioeconomic class, address, previous vaccination history, bitten animal, category of bite, history of bleeding and

wound toileting .The patients reporting to the clinic are serially entered into the Anti rabies vaccination Register and a unique number is assigned to each one of them without repetition.

A total of 583 people were registered during the covid 19 lockdown from 24-3-2020 and 30-4-2020. For comparison of patterns, data was also collected from the records of 2019 for the same period from 24-3-2019 and 30-4-2019. There were a total of 832 patients in the same period of 2019 compared to that of 2020. A total sample size of 1415 people with animal exposure were included in this study.

All data was kept confidential and anonymity was maintained. The collected data was entered into an excel sheet and was analysed using SPSS 25. We expressed the quantitative variables in mean and standard deviation and the qualitative variables in proportions.

RESULTS AND DISCUSSION

The study population comprised of 1415 people out of which 774 (54.7%) were males and 640 (45.3%) were females.

Rural-Urban Distribution-There was no considerable reduction in the reporting of rural patients to the clinic for anti rabies treatment during lockdown, but it has decreased to 64.9% from 71% in 2019.

Referral of cases from periphery- During the lockdown period there were 429(73.6%) patients referred from peripheral centers for treatment and the previous year there were 590(70.9%) patients referred from peripheries out of the total 583 and 832 patients respectively(Table no 1).

Delay in treatment initiation- There was no significant change in the pattern of delay in seeking treatment, 76% of people reported within 24 hours in 2019 compared to 78.2% in 2020. But there was an increase in the number of patients who reported within 24-48 hours and a reduction in the number of people who reported after 48 hours in 2020 compared to 2019(OR= 0.614)(Table no 1). It points towards a possibility that people from distant areas might have failed to reach the hospital in time, considering reduction in reporting after 48 hours of exposure and reduction in the total number of cases in 2020 compared to that of 2019.

Animal to which the person was exposed- There were no significant change in the proportions of various animal bites in the years 2020 and 2019, the patterns were almost similar. It implies that during lockdown and the corresponding period in

previous year , the trends were similar , except for a considerable reduction in total number of cases reporting to the clinic during the two periods. The details are given in Table no 2.

Type of Exposure- Out of total cases reported majority of the animal bites were provoked bites(49.5% in2020 against 53.0% in 2020) both during the lockdown period and also during the previous year. There was mild reduction in unprovoked animal bites(Table no.2). There was no considerable difference in the proportions of provoked and unprovoked bites while comparing them with that of the previous year. But there is a significant increase in the number of accidental bites(17.4% in 2020 against 9.5% in 2019)(95% CI, OR 1.518 to 2.855), which might be due to an increased exposure of human beings with animals which was caused by increased time spent by humans indoors due to lockdown(Table no.2).

Site Of Wound- The site of presentation of the wound was also similar and it was limbs constituting for 77% in 2019 and 83.5% in 2020(Table no 3). Other sites such as head ,neck, trunk, multiple sites etc were considerably low in proportion and were having a relatively comparable proportions to the previous year. But there is a considerable increase in proportion of bites in the head and neck during lockdown(8.1% in 2020against 4.9% in 2019)(95% CI, OR 1.691). it might have been due to an increased time spent by humans indoors with animals which might have led to an increased exposures on head and neck. It is of significant importance that it is bites to head and neck that leads to an increased risk of rabies.

Out of animal bites on the limbs, bites on the lower limbs constituted more in number both during 2020 lockdown and the past year but there was not much difference in the total proportion between the bites on upper and lower limbs on each year considered seperately as well as when comparing with the previous year(Table 4).

Category of Exposure- Majority of wound were category 3, there was a mild increase in the number of category 3 wounds reported during 2020, but the increase was not significantly higher. There was a reduction in the total number of cases also. It suggests a doubt that whether this reduction in the total number of cases is attributable to the reduction in reporting of category 1 and 2 animal bites(category 1--5.5% in 2020 against 7.6% in 2019 and category 2--13.6% in 2020 against 21.6% in 2019) , ie; whether people who sustained category 1 and 2 especially category 2 injury which warrants anti rabies vaccination, neglected the exposure and did not seek medical treatment. There was a significant reduction in the reporting of category 2 animal bites in 2020 lockdown period(Table no.4).

Wound Toileting Following the animal bite- 92.1% of people bitten by an animal presenting to tthe clinic had done proper wound toileting with soap and water compared to 7.2% who did not(Table no 4). It shows that the people have a very good awareness about wound hygiene following animal bite exposure which is a major step in reducing the viral load deposited at the wound site which halts the progression of rabies virus infection as the virus colonises the nerves at the wound site from where it migrates towards the brain. It is a major factor thet would help in the reduction of rabies deaths as more and more people gets awareness regarding rabies disease, its pathogenesis, features and mode of transmission ans basic steps in prevention of rabies of which wound toileting constitutes an important place, it will improve health seeking behaviour of people and will help in majority of animal bite victims getting proper treatment which would halt the progression of rabies.

CONCLUSION

We studied the effect of lockdown imposed in kerala state in reporting of animal bite cases in the Preventive clinic OPD of Medical college, Thiruvananthapuram, kerala. We had found out an increase in accidental exposures(17.4% in 2020 against 9.5% in 2019), and an increase in bites to head and neck(8.1% in 2020 against 4.9% in 2019), which might be due to the increased time spent by people indoors during lockdown exposing them to domestic animals. There was however no significant reduction in referral of cases(73.6% in 2020 against 71.0% in 2019) to the center from periphery but there was a reduction in total number of cases reported during the lockdown compared to that of previous year(583 in 2020 against 832 in 2019). There was a reduction in category 1 and category 2 cases during lockdown(5.5% and 13.3% in 2020 against 7.6% and 21.6% in 2019 respectively) which might be due to the neglect of patients in seeking medical attention due to seemingly mild injuries which however has the potential to cause rabies. More than one third of patients did wound toileting with soap and water which points towards the high level of knowledge and awareness of the people about animal bites and its potential aftereffects.

TABLES

Table no.1- proportion of referred and not referred cases reported and delay in reporting across 2019 and 2020.

REFERRED /NOT REFERRED			
YEAR	REFERRED	NOT REFERRED	TOTAL
2019	591(71.0%)	241(29%)	832(100%)
2020	429(73.6%)	154(26.4%)	583(100%)

DELAY IN REPORTING				
YEAR	<24 HOURS	24-48 HOURS	>48 HOURS	TOTAL
2019	633(76%)	37(4.5%)	162(19.5%)	583(100%)
2020	455(78.2%)	52(9.1%)	76(13.2%)	832(100%)

Table no.2- proportions of different animal bites reported and its type(domestic/stray/wild) and the type of exposure across 2019 and 2020.

ANIMAL							
YEAR	DOG	CAT	RAT	BANDICOOT	SQUIRREL	OTHERS	TOTAL
2019	364(62.5%)	173(29.6)	34(5.9%)	5(0.9%)	2(0.3%)	5(0.9%)	583(100%)
2020	529(63.7%)	246(29.6%)	18(2.2%)	3(0.4%)	31(3.7%)	5(0.5%)	832(100%

TYPE OF BITING ANIMAL				
YEAR	DOMESTIC	STRAY	WILD	TOTAL
2019	585(70.3%)	233(28.0%)	14(1.7%)	832(100%)
2020	401(68.7%)	161(28.8%)	14(2.4%)	583(100%)

TYPE OF EXPOSURE				
YEAR	PROVOKED	UNPROVOKED	ACCIDENTAL	TOTAL
2019	441(53.0)	311(37.4%)	79(9.5%)	832(100%)
2020	288(49.5%)	193(33.1%)	102(17.4%)	583(100%

Table no. 3- proportion of cases by the site of animal bite wound with which the patient presented across 2019 and 2020.

SITE OF WOUND							
YEAR	HEAD & NECK	TRUNK	LIMBS	MULTIPLE SITES	BOTH UPPER AND LOWER LIMB	OTHERS	TOTAL
2019	41(4.9%)	24(2.9%)	641(77%)	112(13.5%)	11(1.3%)	3(0.4%)	832(100%)
2020	46(8.1%)	11(1.9%)	484(83.5%)	40(6.9%)	1(0.2%)	1(0.2%)	583(100%)

Table No. 4 - proportion of people presenting with bites in upper and lower limbs(not applicable in category 1 exposure) and the proportions of categories of exposure and wound toileting by the patient immediately following the exposure across 2019 and 2020.

IF LIMBS UPPER OR LOWER				
YEAR	UPPER LIMB	LOWER LIMB	NOT APPLICABLE	TOTAL
2019	307(36.9%)	336(40.4%)	189(22.7%)	832(100%)
2020	226(39.0%)	251(42.8%)	106(17.9%)	583(100%)

CATEGORY OF EXPOSURE				
YEAR	CATEGORY 1	CATEGORY 2	CATEGORY 3	TOTAL
2019	63(7.6%)	180(21.6%)	589(70.8%)	832(100%)
2020	32(5.5%)	77(13.3%)	474(81.2%)	583(100%)

WOUND TOILETING				
YEAR	DONE	NOT DONE	NOT APPLICABLE	TOTAL
2019	766(92.1%)	60(7.2%)	6(0.7%)	832(100%)
2020	539(93.2%)	30(4.3%)	14(2.5%)	583(100%)

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