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Research Article

Epidemiological Pattern and Trend of Animal Exposures Reported to a Tertiary Care Hospital in Kerala

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A B S T R A C T

Introduction: Rabies is a vaccine-preventable zoonotic disease. Globally, dogs account for up to 99% of all human rabies transmissions. The importance of our study is that the knowledge about the epidemiological pattern and the trends in animal exposure cases will help to identify the exact burden of the disease and the need for further actions required to achieve the target of elimination of dog-mediated human rabies.

Methods: A record-based descriptive study was done in the anti-rabies clinic of a tertiary care hospital in Southern Kerala in which all the cases reported to the clinic from January 1, 2019 to December 31, 2024 were included.

Results: A total of 69,801 animal exposure cases were reported in the anti-rabies clinic from January 2019 to December 2024 with an average/ mean of 11,634 (standard deviation: 4679) animal exposure cases per year. The majority of cases had exposure to dogs (58.4%) among which domestic dog exposure was most common (64%). There was an increase in cases from 2019 to 2024 and in 2020; the number of cases was on the lesser side following the COVID-19 pandemic. While analyzing the trend, the maximum number of cases were reported during the months of April–May and August–December.

Conclusion: As there is ample evidence that the number of animal exposure cases is on the rise, it is high time that we intervene for the prevention and control of rabies.

Keywords: Animal Exposure, Rabies, Trend, Kerala

Introduction

Rabies is a vaccine-preventable, viral, zoonotic disease which is practically 100% fatal, once symptoms appear. Dogs are the primary source of rabies accounting for up to 99% of all human rabies transmissions.[1] It has also been found in cats, wild animals, bats, and monkeys. Rabies is transmitted to man usually by bites or licks of rabid animals.[2]

An estimated number of approximately 59,000 deaths occur globally due to rabies every year even though effective vaccination is available.[3] In India, which is endemic for rabies, every rabid animal exposure is considered with utmost priority. India is also targeting to eliminate dog-

mediated human rabies by 2030 as a part of the global strategy.[4] The importance of our study is that the knowledge about the epidemiological pattern and the trends in animal exposure cases will help to identify the exact burden of the disease and it will aid in effective planning of the preventive and public health measures. Only a few studies have been conducted regarding the epidemiological pattern and trend analysis of animal bite cases in Southern India despite the fact that numerous studies have been carried out in various other regions of the country.

Materials and Methods

A record-based descriptive study was done in the anti-rabies clinic of a tertiary care hospital in Southern Kerala from December 2024 to January 2025 in which all the 69,801 cases reported during the period from January 1, 2019 to December 31, 2024 were included. The details of the cases were obtained from the records kept in the anti-rabies clinic after obtaining approval from the authorities. Data collection was initiated after obtaining ethics committee clearance. Data from January 1, 2019 to December 31, 2024 were collected and analyzed. Cases for which the sociodemographic details of the study participants were not available in the register, were excluded from the study. Data regarding the nature of the animal, category of bite, month and year-wise trend were taken, entered into an MS Excel sheet, and analyzed using SPSS version 27.0.

Results

A total of 69,801 animal exposure cases were reported in the anti-rabies clinic from January 2019 to December 2024 with an average/ mean of 11,634 (standard deviation: 4679) animal exposure cases per year. There is an increasing trend in animal exposure cases from 2019 to 2024 with the maximum number of cases reported in 2024 (Figure 1). During the year 2020, the number of cases was on the lesser side; this might be due to the implementation of lockdown following the COVID-19 pandemic. While analyzing the trend, it was noticed that the maximum number of cases were reported during the months of April–May and August–December (Figure 2).

Out of the total cases, the majority were Category III exposures (81%) followed by Category II (16.2%) and only 2.8% of cases belonged to Category I (Figure 3). The majority of cases had exposure to dogs (58.4%) followed by cats (35.8%), and rats (2.8%). The remaining cases had exposure to monkeys, mongooses, wild boars and others (including cows, goats, civet cats, and porcupines) (Figure 4). According to the type of animal, domestic animal exposures (66.4%) were the most predominant, among which domestic dog exposure (64%) was reported the most (Figure 5).

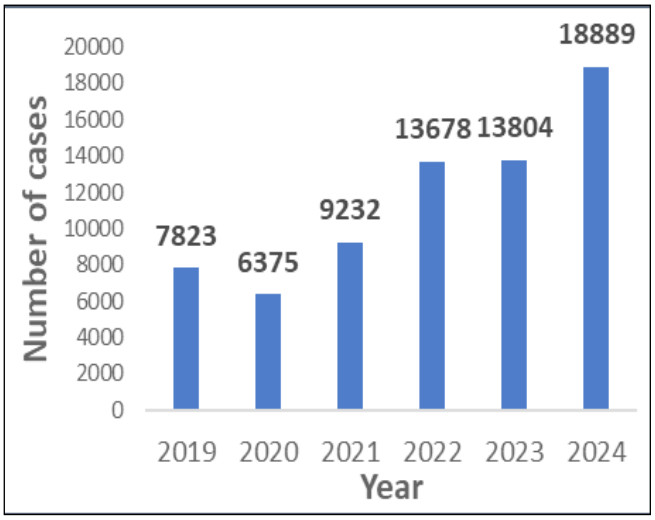

Figure 1.Total New Cases: Year-Wise Trend

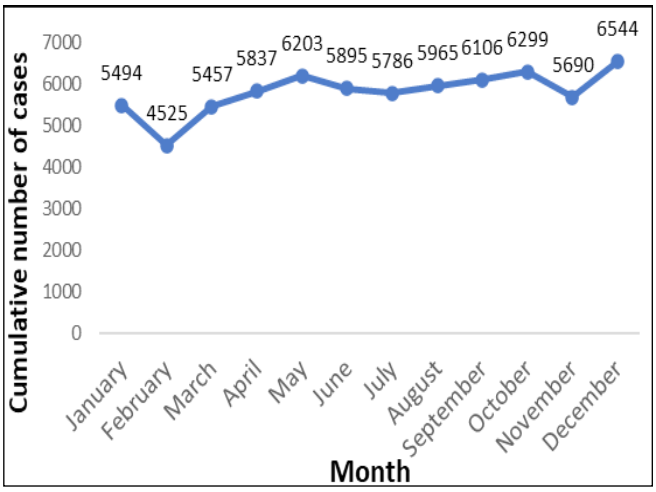

Figure 2.Month-Wise Trend in Animal Exposure Cases(2019–2024)

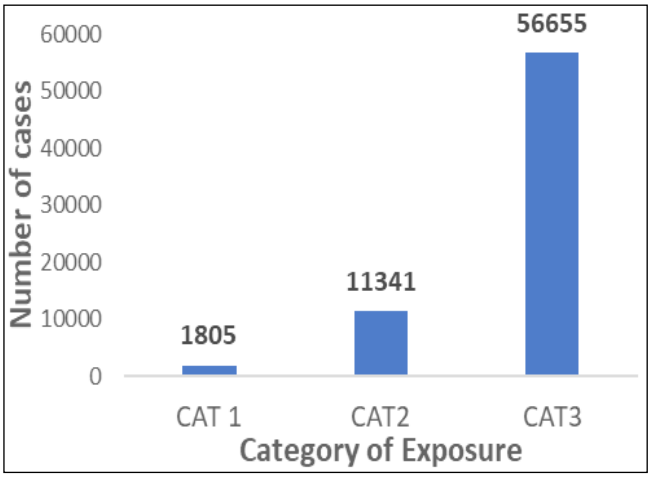

Figure 3.Number of Cases According to Category of Exposure

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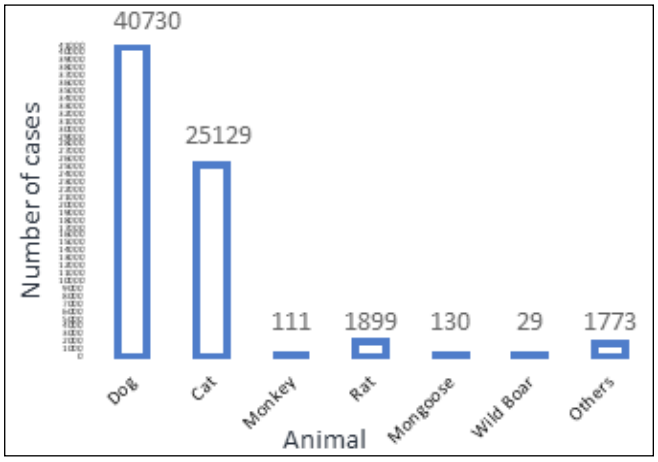

Figure 4.Distribution of Animal Exposure Cases According to the Animal

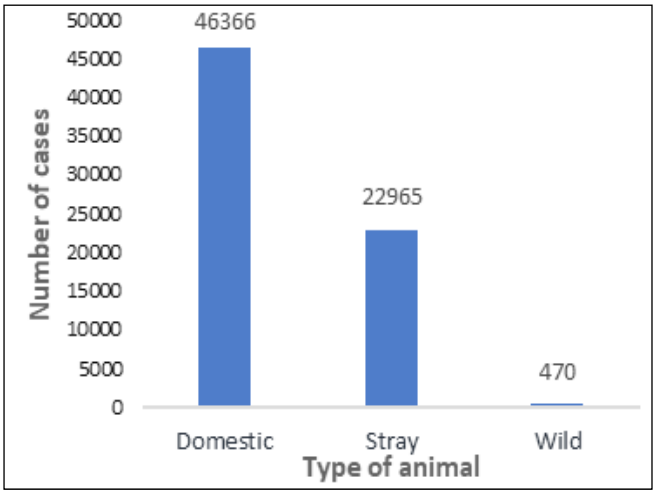

Figure 5.Distribution of Animal Exposure Cases According to the Type of the Animal

Discussion

This study was conducted to analyze the epidemiological pattern and trend of animal exposures reported during the six-year period (2019–2024). It was found that the number of cases reported was on the rise during the study period. This increasing trend may be attributed to the increased awareness among people leading to increased reporting of cases, and due to the increased animal-human interactions. Similar studies conducted by Jethani et al. and Saleem et al. also revealed a rising trend of animal exposure cases and they commented deforestation as a factor contributing to this, as it caused increased interaction between animals and human beings.[5,6] There was a decrease in the number of cases during the COVID-19 pandemic; the study conducted by Satapathy et al. also showed similar findings.[7]

Our study revealed that the cases showed a peak during the months of April to May which is the summer season during which outdoor activities of the people are more, and from August to December which coincides with the breeding season of the dogs. Studies done by Saleem et al. and Gaffari-fam et al. also showed that the cases peaked during the spring and summer seasons.[6,8]

It was found that the majority (81%) of the cases that were reported to the anti-rabies clinic belonged to Category III exposure. As the Category III cases are severe and require immediate medical attention, the majority of the cases from peripheral centers are referred for further management to the tertiary care centers which might have been reflected in the increased number of Category III cases in our study. Similar findings were reported from the studies conducted by Bashir et al., Ichhpujani et al. and Gogtay et al.[9–11] In most of the Category III bites, the severity of the exposure might be the driving factor for reporting and thereby increasing the number of Category III cases being notified.

In our study, it was also found that the majority of animal bite cases were due to dogs (58.4%), most of which were domestic (64%). This was similar to findings reported by Jethani et al., Gaffari-fam et al., and Babazadeh et al.[5,8,12] Contrary to our study, in a study done by Sudarshan et al. and a systematic review by John et al., the majority of the bites were due to stray dogs.[13,14]

As the burden of the disease increases, there is a chance for an increase in mortality due to the disease too as indicated by the estimated number of rabies deaths every year. Awareness generation should be started from the community level for the timely reporting of the cases. The data regarding current trends and epidemiological patterns in animal exposure cases will aid in the management of the supply chain and logistics ensuring an uninterrupted supply of vaccine and immunoglobulin and in the modification of the existing policies, thereby augmenting rabies prevention strategies.

Conclusion

According to the evidence obtained from our study, it can be concluded that the number of animal exposure cases is on the rise, and it is high time that we intervene for the prevention and control of rabies. In our study, dog exposures were found to be the most frequent type of animal exposure. Category III exposure accounted for the majority of cases, followed by Category II exposure.

Studies regarding the trend of animal exposure will aid in the management of vaccine supply and logistics by the stakeholders. Rabies control can be achieved by focusing mainly on raising public awareness about the disease and its prevention. Giving due consideration in controlling the stray dog population and preventing rabies in animals is equally important in preventing the transmission of rabies. This can be achieved through the implementation of one health approach.

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It is the need of the hour that responsible pet ownership along with timely vaccination of the pets should be encouraged. Along with the above-mentioned strategies, strict implementation of animal birth control activities under the National Rabies Control Program should also be given more emphasis.

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Authors' Contributions: All the authors made substantial contribution to concept and design, acquisition of data, analysis, interpretation of data, drafting the article and final approval of the version to be published.

Declaration of Generative AI and AI-Assisted Technologies in the Writing Process: None

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