

Prevalence of Rabies among Hospital-Admitted Rabies Suspected Dogs in and around Chennai at Tamilnadu

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(Received: 4th September 2024 | Accepted: 18th December 2024)

Abstract

The present study aimed to identify the prevalence of rabies cases in and around Chennai from January 2023 to December 2023. Data were collected from rabies suspected dog cases which were admitted in under observation for rabies (UOR) of the rabies ward, Teaching Hospital, Madras Veterinary College, Chennai, Tamilnadu. The data for one year of rabies suspected cases were confirmed in post-mortem based on FAT and modified William's stain method. The prevalence of rabies for one year was 77.8%. The prevalence of males was 74.6% and females were 67.6%. Breed-wise prevalence of non-descript and others (German shepherd, Doberman, Spitz, Combai, Chippiparai was 79 and 100 percent, respectively. Positive prevalence of susceptible age group was 45, 61.5, 50, 40 and 66.7% of 0-3 months 3-6 months, 6-9 months, 9-12 months and above one year, respectively. The positive prevalence of unvaccinated dogs and booster-given dogs were 77.1 and 52.4% respectively. Month wise positive prevalence of rabies was highest in May (92.8%) and lowest in December (20%). Many owners brought the stray dogs for their clinical signs without any awareness of rabies. This study highlights the need to promote knowledge regarding rabies awareness and further surveillance. Owned non-descript dogs attributed to the higher prevalence. Hence, educating owners about rabies vaccination is needed because dogs act as a reservoir host for human rabies.

Keywords: Rabies, Stray dogs, FAT, Dog-bite, Dumb form

Introduction:

Rabies is a fatal and zoonotic disease of mammals and is endemic in India (Hampson et al., 2015). Most of the human cases of rabies occur on the globe due to dog bites of more than 95% (Ghosh, 2006). Rabies is a neglected disease in humans especially in poor and middle-class populations (WHO, 1998) and in the tropics and sub-tropics region (WHO, 2020). Mortality due to rabies in Asia is mainly due to free-roaming dogs (Shah et al., 2012). Dogs are an important reservoir for rabies causing more than 97% of deaths in humans (Suraweera et al., 2012). Canine rabies is a threat to more than 3.3 billion people worldwide (WHO, 2010). In dogs, rabies occurs in two forms furious and dumb form (Kaplan et al., 1986). In India, rabies is endemic due to its poor dog population management, lack of vaccination awareness, pre-post bite exposure vaccine awareness and poor education knowledge on rabies (Sudarshan et al., 2006).

Free roaming and community dogs are responsible as a public menace for various reasons besides biting and rabies (Tiwari et al., 2019a, b). In India, human rabies was declared as notifiable in 2021 (Ministry of Health and Family Welfare, 2021) for rabies recording accurate data which is important for developing and implementing prevention and control measures.

World Health Organization (WHO), World Organization for Animal Health (WOAH) and Food and Agriculture Organization (FAO) have aimed to work under one health approach and aim is to develop a framework for epidemiology and surveillance of rabies and adopting one health approach to enhance rabies control and create awareness to eliminate rabies in human by 2030 (de la Rocque et al., 2023).

The objective of this current study is documentation of animal rabies prevalence from January 2023 to December 2023. This study was designed to survey the prevalence of rabies among hospital-admitted rabies suspected dogs in and around Chennai at Tamilnadu in India.

Materials and Methods:

Study area

Rabies-suspected dogs were admitted in under observation of rabies at the Teaching Veterinary Hospital of Madras Veterinary College, Chennai Tamilnadu. The dogs were kept in UOR for 10 days and dead dogs were sent to post-mortem examination for the confirmation of rabies. The rabies-suspected cases were admitted in UOR with details of breed, age, sex and vaccination status of the animals.

Dogs admitted with different age groups of 0-3 months, 3-6 months, 6-9 months, 9-12 months and greater than 1 year with the clinical symptoms of respiratory symptoms, aggressiveness, salivation, leg paralysis, drooped jaw and brownish discoloration of tongue.

Dogs that showed clinical signs of salivation, aggressiveness, respiratory distress with leg paralysis, locked mouth and brownish discolorations of tongue were brought to Teaching Veterinary Hospital, Madras Veterinary College, Chennai with the above clinical signs and animal details collected like age, breed, sex, vaccination history and admitted in under observation for rabies (UOR) for 10 days for the rabies incubation period and animals after death of 10 days or before that was sent to postmortem for pathology to confirm the Rabies. The results of the Fluorescent Antibody Test and Williams modified Van Gieson's stain for Negri bodies used as a criterion for the confirmation of rabies in the dogs admitted in UOR from January 2023 to December 2023. Since the presence of viral inclusion bodies and Negri bodies were considered positive for rabies this was the most often test to declare rabies positives in post-mortem brain hippocampus impression smears. The data collected based on this from January 2023 to December 2023 were analyzed to determine the pattern of Rabies in the said population.

Results and Discussion:

The present study was to identify the rabies cases in and around Chennai from January 2023 to December 2023. Data were collected from rabies-suspected cases which were admitted under observation of the Rabies ward, teaching hospital, Madras Veterinary College, Chennai, Tamilnadu. The data for one year of rabies suspected cases were confirmed in post-mortem based on FAT and modified William's stain method. Rabies suspected dogs were 104 and rabies positive number was 81 and prevalence of rabies for one year from January 2023 to December 2023 was 77.8% (Figure 6A, B, C and D).

Breed-wise prevalence of rabies

The total number of dogs admitted in the nondescript breed was 81, out of which 64 dogs were positive for rabies (79%) in non-descript breeds and other breeds like Doberman, German shepherd, Spitz, Labrador, Dalmatian and country breeds like Combi and Chippiparai breeds were shown 100% positive and admitted as suspected cases. Non-descript breeds were shown higher positivity than other breeds in Table 1 and Figure 1.

Sex-wise prevalence of rabies

The total number of male and female dogs admitted in UOR was 67 and 37 from January 2023 to December 2023 of which 47 and 23 nos of male and female dogs,

respectively showed positive prevalence of 74.6% and 67.6% for rabies in Table 2 and Figure 2.

Age-wise prevalence of rabies

Positive prevalence of susceptible age group was above one year (66.6%) aged 3-6 months (61.5%), aged 6-9 months (50%), aged 0-3 months (45%) aged 9-12 months (40%) respectively. These results showed that the age group above one year was highly susceptible and 3-6 months was the second highest susceptible age group of Rabies when compared to another age group in Table 3 and Figure 3.

Month-wise prevalence of rabies

Month-wise positive prevalence of rabies was highest in May (92.8%) and followed by February (90.9%). The lowest positive prevalence of rabid dogs was recorded in the month of December (20 %). [Table 4; Figure 4].

Vaccination status of rabies dogs

The total number of admitted unvaccinated dogs was 83 and 64 dogs showed positivity for rabies and the positive prevalence was 77.1%. Among admitted dog's booster dose given to 21 in number and shown positive for 11 animals and the positive prevalence was 52.4% in (Table 5; Figure 5). Unvaccinated dogs showed a higher positive prevalence (77.1%) than primary vaccinated dogs (52.4%).

Table 1: Breed-wise Positive prevalence of rabies-infected dogs

Breeds	Total number of dogs-admitted	Positive	Positive prevalence (Percentage)
ND	81	64	79
DALM	3	3	100
GSD	6	6	100
CHIPPI	1	1	100
COMBI	2	2	100
DOB	3	3	100
SPITZ	8	8	100

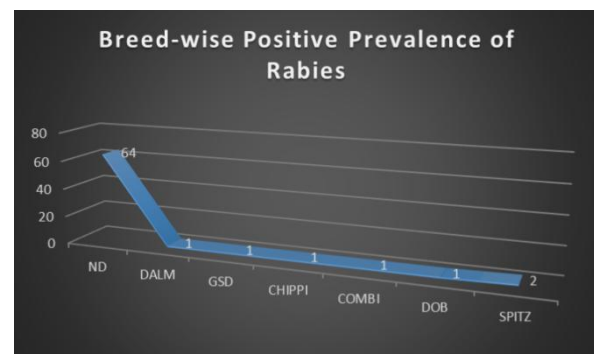
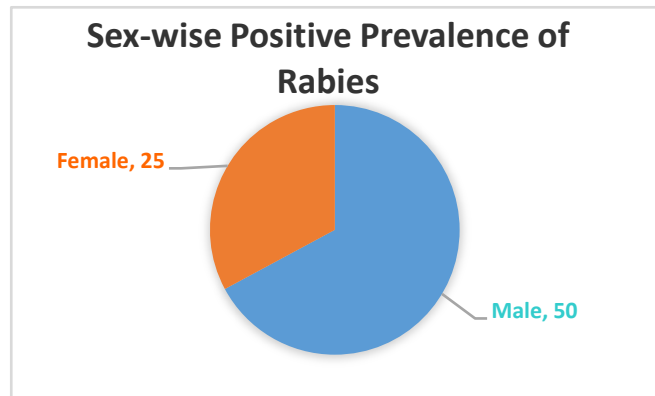


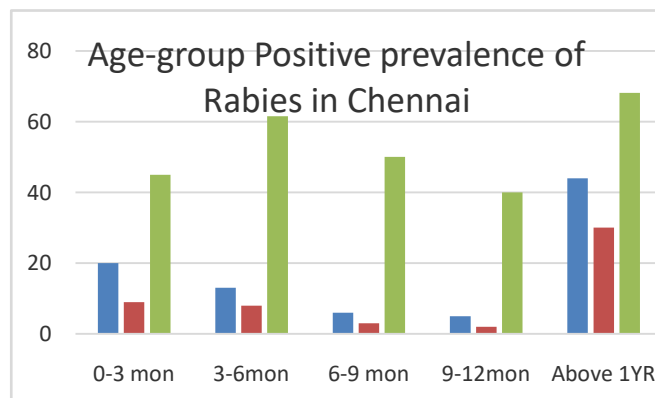
Figure 1: Breed-wise positive prevalence of rabies-infected dogs

Table 2: Sex-wise -Positive prevalence of Rabies

Sex	Total Number of animals	Positive	Positive prevalence (%age)
Male	67	50	74.6
Female	37	25	67.6

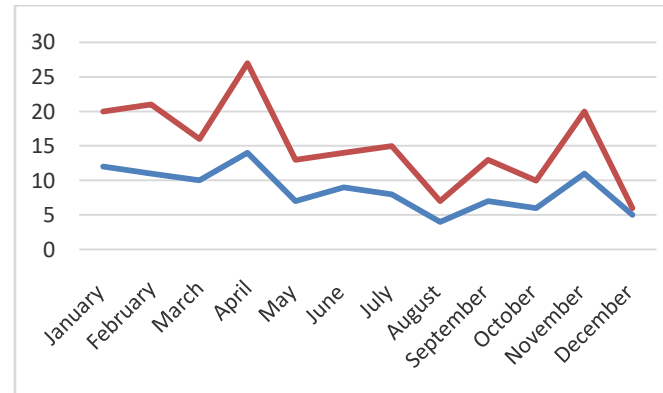
**Figure 2: Sex-wise positive prevalence of Rabies****Table 3: Age-wise Positive prevalence of Rabies**

Age	Total number	Positive	Positive prevalence (Percentage)
0-3 mon	20	9	45
3-6mon	13	8	61.5
6-9 mon	6	3	50
9-12mon	5	2	40
Above 1YR	60	40	66.7

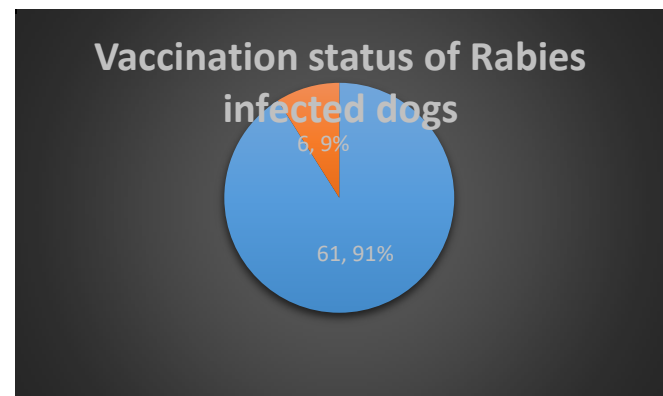
**Figure 3: Age-wise positive prevalence of Rabies****Table 4: Month-wise positive prevalence of rabies**

Months	No. of cases admitted	No. of positive cases	Positive prevalence
January	12	8	66.6
February	11	10	90.9
March	10	6	60
April	14	13	92.85

May	7	6	85.71
June	9	5	55.5
July	8	7	87.5
August	4	3	75
September	7	6	85.71
October	6	4	66.6
November	11	9	81.8
December	5	1	20

**Figure 4: Month-wise Positive prevalence of Rabies in Dogs****Table 5: Vaccination status of the Rabies infected dogs**

Vaccination status	Total number of animals	Positive	Positive Prevalence (Percentage)
Unvaccinated	83	64	77.1
Primary vaccination	21	11	52.4

**Figure 5: Vaccination status of Rabies infected dogs**

This study aimed to provide the data which include details of age, sex, breed and vaccination status of the dogs were analyzed based on the clinical symptoms of rabies-suspected cases and PM confirmation report of rabies-suspected dogs to study the positive prevalence

of Rabies in and around Chennai from January 2023 to December 2023 which was admitted in teaching veterinary hospital, Madras veterinary college in Chennai. Out of 104 dogs, 81 were positive dogs and its positive prevalence was 77.8%.

In this study, the highest level of positive prevalence of rabies was recorded in non-descript breeds followed by pedigree dogs agreed with the findings of Thiptara et al., 2011, Karshima et al., 2013 and Yale et al., 2013. This may be due to the increased local population with a lack of vaccination knowledge and irregular vaccination was predisposed the nondescript breed to higher positivity than the other breeds. Male dogs were more highly infected than female dogs which coincides with the findings of Gunaseelan et al., 2004; Thiptara et al., 2011; Kujul et al., 2012; Karshima et al., 2013 and Yale et al., 2013 may be due to dominant territorial activity and fighting among male dogs.

Thiptara et al. (2011) reported that the age group of above one year was more susceptible than the other age group. This may be due to greater activity during the breeding season and irregular vaccination and unawareness of rabies to the owner may play a role in the transmission of rabies during fighting in the breeding season (Yale et al., 2013). Three - six months of age group showed second higher positivity (Karshima et al., 2013) may be due to a lack of maternal immunity due to improper vaccination by the owner and the puppies were highly susceptible when exposed.

The highest positive prevalence of rabid dogs was in April (92.85%) and February (90.9%) coincides with the results of Ezeokoli and Umoh (1987) who reported higher rabies positive in April due to increased breeding activity during the breeding season of January to March. Increased susceptibility in summer months due to increased breeding activity in January to March due to increased chances of contact, higher mobility and interaction between dogs (Gunseelan et al., 2004; Ehizibolo et al. 2009; Thiptara et al. 2011 and Yale et al., 2013).

The total number of admitted unvaccinated dogs was 83 in numbers and 64 dogs showed positivity for rabies and the positive prevalence was 77.1%. Among admitted dog's booster dose given to dogs was 21 in number and shown positive for 11 animals and positive prevalence was 52.4%. This may be due to unawareness and irregular vaccination of dogs by the owner and possibly owners of Nondescript dogs resorted to lower priced vaccines, lower quality and improper cold chain maintenance of vaccine (Yale et al., 2013).

The studies provided the data regarding positive prevalence of dogs in and around Chennai in

association with the control of human rabies due to the urban cycle of rabies by dogs. Regular investigation through epidemiological data will play a role in the control of rabies in humans as well as the control of rabies in dogs by 2030.

Conclusion:

In this study, the positive prevalence of rabies for one year from January 2023 to December 2023 was 77.8 %. The positive prevalence of male and females was 75.8% and 69.6%, respectively. Breed-wise positive prevalence of non-descript and others (German shepherd, Doberman, Spitz, Combai, Chippiparai) was 79 and one percent respectively. Positive prevalence of susceptible age groups was 66.6, 61.5, 50, 45 and 40% of those aged above one year, aged 3-6 months, aged 6-9 months, aged 0-3 months, aged 9-12 months respectively. The positive prevalence of unvaccinated dogs and booster-given dogs were 77.2% and 54.5%, respectively. Many owners brought the stray dogs for their clinical signs without any awareness of rabies. This study highlights the need to promote knowledge regarding rabies awareness and further surveillance. Owned non-descript dogs attributed to the higher incidence. Hence, educating owners about rabies vaccination is needed because dogs act as a reservoir for human rabies. Post-exposure prophylactic dogs were also shown positivity to rabies which may be due to lowered vaccine quality, improper cold chain vaccine maintenance and lack of knowledge of the correct PEP schedule.

Conflict of interest:

Not applicable.

Data availability:

All raw data and backup photography are preserved at the Department of Veterinary Preventive Medicine and Epidemiology, Tamil Nadu Veterinary and Animal Sciences University, Chennai, Tamil Nadu.

Ethical statement:

Author maintained all ethical concern during sample collection and do not require IAEC certificate as it's not experimental.

Author's contribution:

Not applicable.

Acknowledgments:

The authors duly acknowledge all the support from the Department of Veterinary Preventive Medicine and Epidemiology, Tamil Nadu Veterinary and Animal Sciences University, Chennai, Tamil Nadu.

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Figure 6: Rabies positive dogs

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Citation: Harikrishnan, P. Prevalence of Rabies Among Hospital-Admitted Rabies Suspected Dogs in and around Chennai at Tamilnadu. Indian Journal of Veterinary Public Health. 2024; 10(2): 47-52.

DOI: <https://doi.org/10.62418/ijvph.10.2.2024.47-52>