



INVESTIGATION ON INCIDENCE OF ANIMAL RABIES IN CENTRAL KERALA

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Abstract

A total of 842 rabies suspected cases submitted for post-mortem diagnosis to the Department of Veterinary Pathology, College of Veterinary and Animal Sciences, Mannuthy, during the period from July 2011 to June 2015 were analysed for this study. 42 per cent of the cases submitted for post-mortem were positive for rabies. Thrissur district registered more positive cases in Central Kerala. Dogs were the major species affected. It was found that there were peaks of positivity during February, May, September and November and a gradual increase of cases during summer. Statistical analysis of the positive cases reported from 2012-2014 showed an increase in number of cases during summer than other seasons. About 75 per cent of cases exhibited the furious form of rabies and in the positive cases the vaccination was neither done nor periodical. Positive cases were also recorded in pups below three months of age.

Key words: Rabies, Central Kerala, FAT

Rabies is a dreadful disease haunting mankind since time unmemorable. The species Canids serve as an important host in harboring and transmitting the disease. Freedom from

rabies can be accomplished by meticulous planning taking into consideration the incidence of the disease, distribution, seasonality and details of animal affected. Underreporting and lack of data had always contributed to the failure of various disease eradication missions. Taking this into consideration, the paper is being presented to provide data on different aspects like incidence of rabies, geographical distribution, species affected, seasonality of the disease, disease manifestation and vaccination status of affected animals based on cases presented to the Department of Veterinary Pathology, College of Veterinary and Animal Sciences, Mannuthy, for post-mortem diagnosis during a period of four years from July 2011 to June 2015. The findings may help in fixing strategies for eradication of the disease in Central Kerala.

Materials and methods

The study was conducted in a total of 842 rabies suspected cases which were submitted for postmortem examination suspecting rabies to the Department of Veterinary Pathology, College of Veterinary and Animal Sciences, Mannuthy. Post-mortem

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samples included the impression smears from hippocampus major in case of canines and felines; and cerebellum in case of ruminants. Samples were fixed in cold acetone and subjected to Direct Fluorescent Antibody Technique (dFAT) according to the standardized procedure (Robles and Miranda, 1992). The details of animals, symptoms exhibited and vaccination status were recorded. Chi-square test was carried out with the data from 2012-2014 to find the significance in the number of positive cases and influence of season over the disease.

Result and Discussion

The details of geographical location of the animals positive for rabies during the study period is depicted in Table (1). The present study revealed that Thrissur district recorded the highest number of cases followed by Palakkad, Ernakulam, Malappuram, Kozhikode, Kottayam and Idukki. This might be attributed to the knowledge of the public about such a diagnostic facility in their vicinity and the geographical placement of the district, which apart from plains also has hilly terrain with forests and areas with shrubs intermingling with domestic settlements. This provides a perfect

Table.1. District-wise incidence of rabies

S.No.	District	Positive cases
1.	Thrissur	247
2.	Palakkad	41
3.	Ernakulam	35
4.	Malappuram	19
5.	Kohikode	7
6.	Kottayam	5
7.	Idukki	3
	Total	357

Table. 2. Percentage of positive cases during the study period

Year	No. of cases presented	No. of positive cases	Percentage of positives
2011 (July- December)	84	34	40.48
2012	227	96	42.29
2013	220	80	36.36
2014	176	70	39.77
2015 (January – June)	135	68	50.37
Total	842	357	
Average			41.85

ambience for the spillover of the disease from the wild also.

The results obtained from the analysis of the cases revealed that 42 per cent of the cases submitted were positive for rabies (Table 2). It is note-worthy that less than 50 per cent of the suspected carcasses which were submitted for post-mortem examination were positive for rabies. Those animals, which exhibited nervous symptoms but were not positive for rabies suffered from ailments of other organ systems like hepatosis, nephrosis, microfilariosis etc. Lesions involving the organ systems as mentioned above had been recorded in those cases, which was evident from the records. The record detail of about 75 per cent of cases exhibiting furious form of rabies also indicates that apart from the positive cases of rabies encephalopathies due to failure of liver, kidney or toxemias due to involvement of other organ systems rather than brain had resulted in an aggressive behavior in those animals. Such abnormal behavior in animals had been mentioned by Dewey(2008).

Chi-square test carried out with the positive cases from 2012-2014 gave a p-value of 0.675585. This indicated that there is no significant difference in the number of positive cases during the three years.

The dogs (329 nos.) were the major contributors to positivity followed by cattle (15 nos.), cat (7 nos.) and goat (4 nos.) which are being represented in Fig (1). Single positive case was recorded in both golden jackal and pig. It was found that the disease had been recorded more in dogs followed by cattle, cat and goat.

As the members of the family canidae are the definitive hosts of the disease it was natural to record more number of cases in dogs, while the other animals get infected from them. Dog bite as the main cause of spread of infection has also been reported by Sudarshan *et al.* (2006). Though a single case, the occurrence in Golden Jackal requires special attention as sylvatic rabies is of concern while planning eradication of rabies. The spill-over from the sylvatic cases to the domestic animals pose a constant threat to the control and eradication which has also been reported by Vos *et al.* (2009). However European countries have controlled sylvatic rabies by effective oral bait vaccination (Vitasek, 2004). The areas adjoining forest fringes and also areas where there are shrubs which can provide sufficient abode for animals like foxes and jackals should be given more consideration to check the spread from the wild to the domestic.

The seasonal trend in the occurrence of the disease was worked out taking into consideration the data of three years namely 2012 (Series 1), 2013 (Series 2) and 2014 (Series 3). A gradual increase of cases during summer except in 2012, where there are equally more cases during North-East monsoon is evident from Fig (1). Chi-square test with the data from 2012-2014 during the various seasons, gave a p-value of 0.049087. This indicate that the result is significant as $p < 0.05$ and there is seasonal influence on the number of positive cases. More number of positive cases was observed during summer than other seasons.

Based on the available recorded data as stated by the dog owners, the dumb form of rabies was reported in 73 cases (25%), while the majority of the cases, nearly 222 cases (75%) exhibited the furious form. The dog cases which were positive for rabies did not have a proper anti-rabies vaccination. Eighty six per cent of the cases were unvaccinated, while in 14% the owners had not carried out the annual vaccination according to the schedule.

When the season wise incidence was analysed a gradual increase in summer might be due to the fight for food during

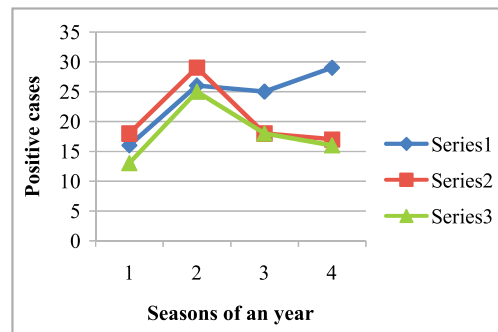


Fig.1. Positive cases recorded during various seasons of a year

1	Jan-Feb	Winter
2	Mar-May	Summer
3	Jun-Sep	SW monsoon
4	Oct-Dec	NE monsoon

summer. There is increase in number of cases during North-East monsoon only during 2012. However, the seasonality could not be attributed to the bi-annual breeding season as opined by Brookes *et al.* (2016). A detailed study for the peak has to be taken-up as the data includes both domestic and street dogs. Nevertheless, this will help planners to take up effective vaccination to maintain protective antibody titer well before the onset of the season as rabies is a disease preventable than curable. This clearly indicated that the disease burden would have been reduced if the animals had been properly vaccinated. Moreover it indicated that detailed information about the benefits of vaccination and maintaining protective antibody titer has to be imparted to the public, which would surely help in control and elimination of rabies as rabies can be prevented if nearly 20-45 per cent of the population have protective antibody titre as suggested by earlier workers (Hampson *et al.*, 2009).

The striking finding after analyzing the data was that pups below three months of age were also affected with rabies. Fourteen cases were recorded in the age group of 1-2 months and 17 cases were recorded in the age group of 2-3 months. It is interesting to note that positive cases were recorded in animals below three months of age. The pups are generally vaccinated after three months of age as it is expected that the maternal antibodies will be

providing proper immunity till that age and the vaccination may neutralize them. However, when there are questionable maternal antibodies and the disease being endemic the vaccination protocol has to be reconsidered and the necessity for proper vaccination of the dam has to be emphasized. There was a report of rabies in a 10 week old pup, in which they had suspected Skunks to be the reservoir host involved in infecting the pup (White *et al.*, 2007). This study indicates that a proper pet ownership, stringent regulations and effective vaccination would surely help in the eradication of the disease.

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References

- Brookes, V.J., Gill, G.S., Singh, C.K., Sandhu, B.S., Dhand, N.K., Singh, B.B., Gill, J.P.S. and Ward, M.P. 2018. Exploring animal rabies endemicity to inform control programmes in Punjab, India. *Zoonoses and Public Health*. **65**: e54-e65
- Dewey, C.W. 2008. A practical guide to canine and feline neurology. 2nd edition. Wiley- Blackwell, USA. p144.
- Hampson, K., Dushoff, J., Cleaveland, S., Haydon, D.T., Kaare, M., Packer, C. and Dobson, A. 2009. Transmission Dynamics and Prospects for the Elimination of Canine Rabies. *PLoS Biol*. **7**(3):e1000053. doi:10.1371/journal.pbio.1000053.
- Robles, C.G. and Miranda, N.L.J. 1992. Comparative Evaluation of the Rabies Fluorescent Antibody Test and Direct Microscopic Examination at the Research Institute for Tropical Medicine. *Phil. J. Microbiol. Infect. Dis.*, **21**:69-72.
- Sudharsan, M.K., Mahendra, B.J., Madhusudana, S.N., Ashwoath Narayana, D.H., Rahman, A., Rao, N.S., X-Meslin, F., Lobo, D., Ravikumar, K. and Gangaboriah. 2006. An epidemiological study of animal bites in India: results of WHO sponsored national multi-centric rabies survey. *J. Commun. Dis.* **38**: 32-9.
- Vitasek, J. 2004. A review of rabies elimination in Europe. *Vet. Med. – Czech*. **49**: 171–185.
- Vos, A., Feuling, C., Eskizmirli, S., Un, H., Aylan, O., Johnson, N., Gurbuz, S., Muller, W., Akkoca, N., Muller, T., Fooks, A.R., Askaroglu H. 2009. Rabies in Foxes, Aegesn Region, Turkey. *Emerg Infect. Dis.* **15**: 1620-1622.
- White, J., Taylor, S.M., Wolfram, K.K. and O'Conner, B.P. 2007. Rabies in a 10-week-old puppy. *Can. Vet. J.* **48**: 931–934. ■