



A PROSPECTIVE STUDY ON ANIMAL RABIES INCIDENCE IN CHENNAI CITY

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ABSTRACT

Rabies is one of the oldest and fatal zoonotic viral encephalitis and it is transmitted usually through the bite of a rabid animal. Animal species involved in rabies transmission varies in different geographical location. Dogs are presumed to be the main transmitter in India due to high density of dog population. Thorough documentation of animal rabies incidence is required for better application of control strategies. The objective of this current study is to documentation of animal rabies incidence in Chennai city (April 2013 to April 2014). A total of 76 rabies suspected cases that were brought to Madras Veterinary College, Teaching Hospital were confined and held under observation for a period of upto 10 days. Animals which died in confinement were subjected to postmortem examination for collecting brain smears and were subjected to Seller's staining. A total of 76 animals (67 dogs, 3 cats, 5 goats and 1 calf) 60 died in confinement and the rest (16) were discharged. Of which 40 dogs (85.1%), 1 cat (2.13%), 5 goats (10.64%) and 1 calf (2.13%) were positive. Statistical analysis revealed no significant difference in the occurrence of rabies with regard to the incidence in the various species. A larger number of canine rabies cases reported compared to that of other animal, in that majority were owned non-descript dogs. Educating owners about rabies vaccination is needed because they are closer source of rabies to human than stray dogs.

KEYWORDS: Animal Rabies, documentation, Chennai, Seller's staining.**INTRODUCTION**

Rabies is one of the oldest and fatal zoonotic viral encephalitis transmitted to man by bites/licks/scratches of rabid animals and still continues to cause significant human mortality in Asia, South America, Africa (WHO, 1996). It accounts for more than 55,000 deaths each year, about 95% of which occur in Asia and Africa. Rabies deaths results in a loss of about 1.74 million DALYs each year (Knobel *et al.*, 2005) and it is accounts for nearly 20,000 human deaths a year in India which is nearly 50% of the annual global mortality (Sudarshan *et al.*, 2007). Transmission of rabies is usually through the bite of a rabid animal, which introduces the virus present in its saliva into the bite wound (Bowen and Lowings, 2000). Animal species involved in rabies transmission varies in different geographical location. Dogs are presumed to be the main transmitter in India due to high density of dog population. It is estimated that the dog population is around 25 million in India. The other domestic animals like cat, cattle, horse, sheep, and goat may be victims of rabies and transmit it to man (Sudarshan *et al.*, 2007). The dog population density per lakh human population for entire Tamil Nadu was estimated 4,238 per lakh humans as per survey in 2006 (PHFI, 2010) and the dog population in Chennai city was 18,293 in the year 2007 as estimated by Department of Animal Husbandry and Veterinary Services, 18th Livestock Census. The prevalence of rabies is higher in dogs than any other animals in Chennai between 2001 and 2011 (Rahman, 2011). Animal rabies has often been reported to have many clinical presentations main among them being aggression,

unprovoked biting, salivation, progressive paralysis in canines and unusual bellowing, colic, frequent micturation and neuronal dysfunction in farm animals. Transmission of rabies is usually through the bite of a rabid animal, which introduces the virus present in its saliva into the bite wound (Bowen Davies and Lowings, 2000). The objective of this current study is to documentation of animal rabies incidence in Chennai city (April 2013 to April 2014).

MATERIALS**Study population**

The study population consisted of 76 rabies suspected animals submitted to the Under Observation for Rabies (UOR) ward of Madras Veterinary College teaching hospital which included 67 dogs, 3 cats, 5 goats and 1 calf.

Seller's stain solution

Eight parts of methylene blue and 1 part of Basic fuchsin in 10 ml of distilled water.

METHODS

Rabies suspected animals were confined and held under observation for a period of 10days to observe for progression of the disease. The particulars of the animals admitted in UOR with regards to age, sex, breed, number of days in observation and locality were collected and they were monitored everyday till death or upto 10 days when they were discharged. Animals which died in confinement were subjected to postmortem examination for collecting brain samples and brain smears (hippocampus and brain stem) and was subjected to Seller's staining.

Seller's Staining

Seller's staining was performed as per Tierkel and Atanasiu (1996) with slight modification. A fresh touch impression smear of the hippocampus of each sample was made on a clean glass slide and was fixed in absolute methanol for 30 sec. The Seller's stain solution was poured over the impression smear. The slides were heated gently from under until steam emanated. After a minute the slide was washed with distilled water. The slides were dried and examined for round or oval magenta red Negri bodies in cytoplasm of nerve cell under microscope (100X).

RESULTS & DISCUSSION

Clinical rabies in animals

Much of this study is based on a clinical suspicion of rabies and their observation in isolation in the UOR

(Under Observation of Rabies) unit of the Madras Veterinary College teaching hospital.

The animals which were put in this unit showed one or more of the clinical signs or history of rabies which were aggression, unprovoked biting, salivation, progressive paralysis in canines (Fig. 1) and unusual bellowing, colic, frequent micturition and neuronal dysfunction in farm animals (Fig. 2 and 3) (Tepsumethanon *et al.*, 2005). In all the animals admitted during the period of study, the above signs were reported or observed in combinations during the progression of disease particularly in positive cases. Though for each animal admitted, individual clinical signs were not analysed, Yale *et al.* (2013) in their observation of canine rabies also found the above clinical signs but hyperptylism was the most observed in 21% of their positive cases.



FIGURE 1: Rabies affected Dog Biting the cage during quarantine



FIGURE 2: Unusual bellowing and Lateral recumbency in rabid calf



FIGURE 3: Rabid goat butting the wall during quarantine

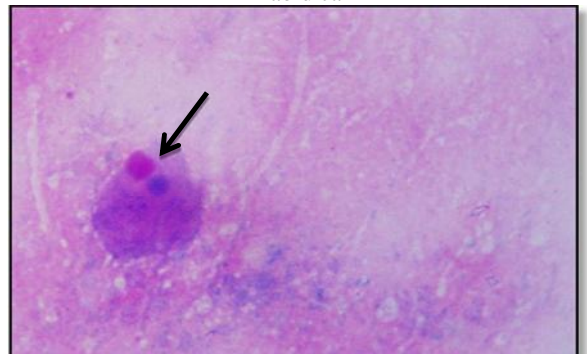


FIGURE 4a - Dog brain impression smear showing magenta coloured Negri body [100x]

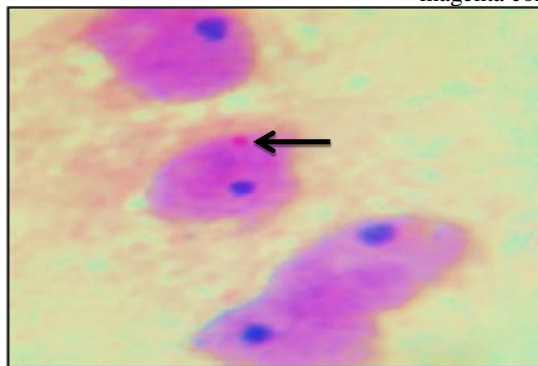


FIGURE 4b - Goat brain impression smear showing magenta coloured Negri body [100x]

Postmortem confirmation of animal rabies

The suspected cases of animal rabies were confirmed on death during confinement, by the presence of intracytoplasmic Negri bodies in brain smear made from hippocampus (Fig. 4a and 4b). Negri body presence in the cytoplasm of the neuron cells are regarded as diagnostic for rabies although their absence does not exclude the disease (King and Turner, 1930). The diagnosis of rabies in animals can be made by utilizing any part of the affected brain but in order to rule out rabies the test should include tissues from at least two locations of the brain mainly brain stem and cerebellum (Swanepoel *et al.*, 1993). However as rabies virus is particularly abundant in the hippocampus (Dean *et al.*, 1996) smears are also

preferred from these sites for Negri bodies as was practiced in this study.

Status of animal rabies admitted in UOR

A total of 76 rabies suspected cases (67 dogs, 3 cats, 5 goats and 1 calf) of different species were admitted in UOR from April 2013 to April 2014 of which 60 died in confinement and the rest (16) were discharged. Seller's staining for intracytoplasmic inclusion body (Negri body) 47 were found positive for rabies. While all the smears from goats (5/5) and calf (1/1) was positive. The number of positives amongst the dogs was 40 out of 52 and 1 out of 2 in cats. There were 13 samples negative by Seller's staining (Table 1).

TABLE 1- Species wise observation of rabies positive by Seller's stain

Species	Positive	Negative	Discharged	Total	Chi-square test
Dogs	40 (85.1%)	12	16	68	
Cats	1 (2.13%)	1	0	2	
Goats	5 (10.64%)	0	0	5	NS
Calf	1 (2.13%)	0	0	1	
Total	47	13	16	76	

Amongst the 47 positives, 85.1% were dogs, 2.13% were cats, 10.64% were goats and 2.13% were calf. Singh *et al.* (2008) in their study of rabies positives amongst various species found a higher incidence in dogs (231) followed by buffaloes (79) cattle (46) and 28 in wild species which was in agreement to this present study. Thiptara *et al.* (2011) in contrast found 73% of cattle admitted to be positive which was higher than the incidence in dogs (51%) and cats (16%), however the number of suspected dogs admitted and positive in their study was quite high (1454/2833) in comparison to other species in Southern Thailand.

Statistical analysis by Chi-square test of this observation revealed no significant difference ($P > 0.05$) in the occurrence of rabies with regard to the incidence in the various species (Table 1) but Thiptara *et al.* (2011) found a positive correlation existed for dog rabies in comparison to cat or cattle rabies and they assumed that rabies in cats and cattle were primarily the result of interactions with rabid dogs (spillover from rabid dogs).

CONCLUSION

Thorough documentation of animal rabies incidence is required for better application of control strategies. Statistical analysis revealed no significant difference in the occurrence of rabies with regard to the incidence in the various species, indicates all the species included in this study are equally susceptible to rabies. A larger number of canine rabies cases reported compared to that of other animal, in that majority were owned non-descript dogs explains reluctance or ignorance of rabies vaccination by owners for these non-descripts.

Vaccination is still the most effective preventive measure to control rabies, especially in its dog reservoir and other animals at risk. The dogs are the main reservoir for the rabies in India, mass rabies vaccination is needed to break the transmission cycle among dogs and other domestic animals. Moreover, public education regarding rabies control and dog management still needs to be emphasized

to decrease animal contact to interrupt rabies transmission among domestic animals.

ACKNOWLEDGEMENT

The authors are thankful to the Department of Veterinary Public health and Epidemiology, Department of Veterinary Clinics and Department of Veterinary Pathology, Madras Veterinary College, TANUVAS, Chennai for the technical and financial help for this study.

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