

Title: WHY A DOG NEEDS TO BE OBSERVED FOR 10 DAYS AFTER BITING A HUMAN BEING?

Author: AK Agarwal¹, R.N. Mahore², M. Bhatia³, P. Yuwane³, S Jain³

1. Associate Professor & I/C Physician Anti Rabies Clinic.
2. Demonstrator.
3. PG (MD) Student.
Department of Community Medicine, G.R. Medical College, Gwalior, MP

Keywords Dog bite, Ten days observation. Anti rabies treatment

Abstract This study was aimed at analyzing a ten day observation period of rabies suspected dogs according to five cardinal signs criteria. Dogs suspected to be Rabid were asked to be observed after an incident of the bite inflicted on a human being. When the dos had bitten a person and showed abnormal behaviour or unusual illness and normal behaviour, they were observed for a period of 10 days.

Original Article

Why a dog needs to be observed for 10 days after biting a human being?

A. K. Agarwal*, R. N. Mahore**, M. Bhatia***, P. Yuwane***, S. Jain***

ABSTRACT

This study was aimed at analyzing a ten-day observation period of Rabies suspected dogs according to five cardinal signs criteria. Dogs suspected of being Rabid were asked to be observed after an incident of the bite inflicted by it on a human being. When the dogs had bitten a person and showed abnormal behaviour or unusual illness and normal behaviour, they were observed for a period of 10 days. Through retrospective and prospective data between 2000 and 2012 a total of 11987 dogs were collected for the ten-day observation period. If an animal had survived for > or =10 days, it was recommended to stop post exposure anti rabies treatment as per WHO guidelines. A total of 5339 dogs found or suspected to be rabid, with abnormal behaviour died within 10 days of observation. Five clinical features criteria were analyzed from the first day of the observation period. This experience with the implemented 10-day observation period confirms the WHO recommendation on identifying suspected rabid dogs or cats under supervision following a human exposure.

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INTRODUCTION

All warm-blooded animals, including humans, are susceptible to being infected with the rabies virus. The virus is usually transmitted through bites and scratches, or licks over broken skin or intact mucous membranes. Once the rabies virus enters the body, it travels along the nervous system until it finally reaches the brain. After a dog begins to show symptoms of Rabies, death is expected to occur within 10 days. There is no cure once signs of Rabies develop within the animal. An evidence-based post exposure treatment plan requires assessment of the actual risk of the exposure¹.

Buddhist and Hindu cultures mentions about cases of when subjects were bitten by dogs and cats, or by animals showing abnormal behaviour, the animals were killed by people. This has provided us with an opportunity to observe the natural course of rabies in dogs observed under humane conditions without therapeutic interventions. Authoritative publications recommend euthanasia and performance of laboratory testing for a possibly rabid dog or cat that has bitten a person, but It has been shown that post-mortem diagnostic techniques are of no value for intravital diagnosis of rabies in dogs and cats^{2,4}. If this is inappropriate or impossible, the animal should be observed for > 10 days even in cases of pet and vaccinated dog/cat inflicted exposures.

The definitive diagnosis of rabies in dogs is done by testing brain samples using laboratory methods recommended the WHO¹ and if there is a likely rabies exposure, WHO recommends immediate euthanasia of the responsible animal and examination of neural tissue using fluorescent antibody techniques. This is difficult or even impossible in most Buddhist or Hindu societies which abhor killing the animal and prefer having it caged and observed for clinical signs⁵.

If a dog and cat is alive and healthy after that time, the patient can be assured that the animal was not infected with rabies. If the post exposure rabies prophylaxis had been started for the bite victim, treatment can be terminated after 10 days. This recommendation is based largely on experimental studies by Vaughan et al.⁶ in 1963 and Vaughan et al.⁷ in 1965. They artificially infected test animals and observed them until their natural deaths. Our present study is a report of a retrospective and prospective study carried out between 2000 and 2012 of naturally infected rabid dogs that had been observed for 10 days.

MATERIALS AND METHODS

Histories and clinical signs were analyzed from 11987 records of dogs that had bitten a human being and were noted to behave abnormally or appeared ill.

* Associate Professor & I/C Physician Anti Rabies Clinic. ** Demonstrator, *** PG (MD) student Department of Community Medicine
Address for Correspondence: *Dr. Anil Kumar Agarwal (APCRI LM 251), Associate Professor & I/C Physician Antirabies clinic, 4, Medical College Campus G. R. Medical College, Gwalior 474009 (MP), anilanjindia@rediffmail.com. 7566807559

The authors selected five clinical features in the suspected rabid dogs to be noted, and they were:

1. Bites to two or more person without provocation.
2. Restlessness and wandering aimlessly.
3. Excessive salivation.
4. Unable to bark, or change in the voice.
5. Appears ill and doesn't eat or drink.

Dogs showing a minimum of 2 clinical signs were categorised as Rabies suspected dogs. In this study 5,339 Dogs were categorised as rabies suspected dogs that had bitten humans between 2000 and 2012.

After recording of victim's description of events leading to observation of the animal, the animals were kept under observation by the victims themselves. No treatment was administered to the animal. The victim was asked to offer food and water to the dogs and cats and if an animal died or became untraced, they were asked to report immediately at our anti rabies clinic. If the dogs were untraceable and expired due to unnatural death, they were not included in the study sample. If an animal survived for more than 10 days of observation and appeared healthy, the victim was re-assured and told that there was no possibility of rabies infection and further anti rabies treatment was not required.

RESULTS

In the retrospective and prospective studies, the authors found that the criteria of abnormal

behaviour was found in 5,339 dogs. Almost all dogs were observed for maximum of 10 days after there was a bite event. All dogs in this study who were suspected to be rabid by abnormal behaviour, died naturally during the observation period. We found that none of the dogs suspected to be rabid and had abnormal behaviour, lived for more than 10 days after observation (Table 1). There was no method to discriminate the dogs that had the encephalitic (furious) form or the paralytic form of rabies. Not all, the animals could be observed for 10 days due them being untraceable during the observation period.

A total of 5339 dogs had abnormal behaviour, and were observed for 10 days. Mean survival of the Dogs was 2.54±1.11days; (99%CI 2.50 - 2.58 days) of the total dogs under observation, with a SE of 0.15.

At third day 2670, or 50% (99%CI 2576-2764) dogs died of rabies and the median survival time was 3 days. We found that the 95th percentile of death time was 5 days, with an SE of 0.22 days. (This means that 95 in 100 rabid dogs would die of rabies within 5 days) and 100% by 7 days (Fig.1). There was a highly significant difference between death of dogs of abnormal behaviour and normal behaviour for equality of survival distributions by log rank statistic (p<0.00000) { Table 1 }.

DISCUSSION

The authors had learned in a previous study that dogs suspected of being rabid due to abnormal

Table 1
Outcome of dogs recommended for 10 days observation

Outcomes	No. of Dogs (by Observation days)										p-value
	1	2	3	4	5	6	7	8	9	10	
Death of dogs with minimum 2 unusual behaviour in 5* (n= 5339 {5339})	1046	1470	2072	495	156	94	06	0	0	0	d.f.= 9 0.00000#
Survival	4293	2823	751	256	100	06	00				
Death of dogs with normal behaviour (n=1156 {6648})	125	114	119	113	120	122	110	109	111	113	d.f.= 9 <0.05##
Survival	6523	6409	6290	6177	6057	5935	5825	5716	5605	5492^	
p-value	d.f. = 18, 0.0000000#										

*1. Bites to two or more person without provoke, 2. Restless wander aimlessly, 3. Excessive salivation, 4. Unable to bark, 5. Appear ill and don't eat & drink
Highly significant statistically
##Not Significant ^ Post Exposure treatment may be stopped

behaviour and submitted for observation did not remain alive for more than 10 days⁵. This would then represent an additional clinical criterion against a diagnosis of rabies which would be of particular interest where necropsy and reliable laboratory diagnoses is not possible⁸.

A total of 11987 dogs that had bitten human beings and were traceable and were observed for up to 10 days. Of these 5339 dogs that were suspected to be rabid by having cardinal signs of unusual behaviour survived <10 days after inflicting a bite

on a human being. This study supports the current WHO recommendations that dogs that are suspected of being rabid should be confined and observed for 10 days.

The data supports the idea of minimum 10 days observation period for dogs suspected of being Rabid, based on clinical signs. Three days are added for maximizing safety after 7th day when the last rabies suspected dog was dead because by the studies by many authors^{6,7} and WHO¹¹ found that salivary gland excretion of rabies virus in cats and

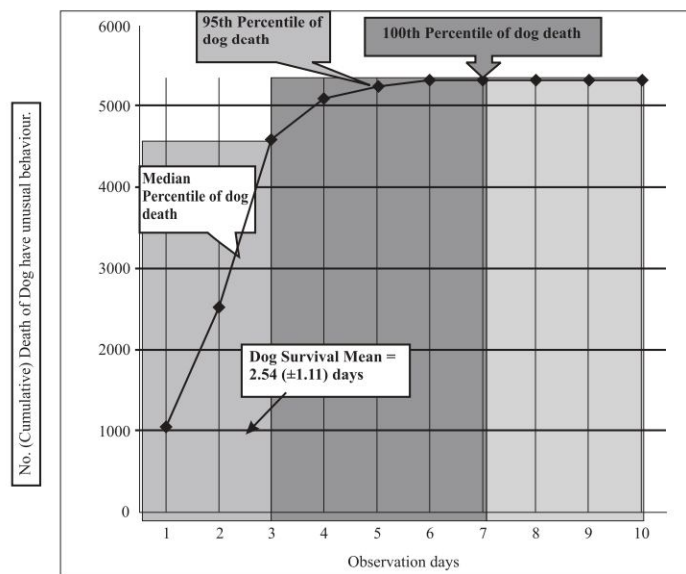


Fig.1 : Death of Dog under Observation after their bite having unusual behaviour

dogs was not identified prior to 3 days before onset of illness. Central Research Institute, Kasauli, India also explained that once the symptoms of rabies appear in an animal it does not survive more than a week.⁹

10 days observation period ensures that the dog remains available for keeping a watch of the signs of rabies. If the animal remains healthy during the 10 days, it's an indication that the animal didn't have the rabies virus in saliva at the time of bite and the victim does not have to receive an expensive and unpleasant series of vaccinations to prevent rabies and eliminates the need to destroy normal

animal in suspicion of being rabid. It is also important that the animal be strictly observed at all times so that it cannot run away.

The 10-day confinement and observation period for dog has withstood the test of time as a way to prevent human rabies¹².

The most important health question concerning the excretion of rabies virus is the precise time that the excretion in the saliva begins. In most instances the virus appears to be excreted in the saliva after the onset of clinical signs of disease. Early investigators reported isolating rabies virus from experimentally infected dogs as early as three days

before signs of disease appeared¹⁰. Since an approach to the clinical diagnosis of rabies in living dogs has been neglected by the literature, the authors describe a method based on observing the animal and recording certain signs that allow or exclude a presumptive diagnosis of rabies. If, after the 10-day period is over, the dog shows no signs of rabies, it will be determined that the dog did not transmit rabies to the individual who was bitten and the observation period eliminates the need to destroy healthy pets to test their brains for the rabies virus.

This study supports findings by Vaughn and colleagues^{6,7} that experimentally infected cats and dogs do not survive >9 days after the onset of clinical signs of rabies. In the series by Fekadu et al.¹⁰ dogs survived no longer than 7 days. The studies by Vaughn and colleagues^{6,7} found that salivary gland excretion of rabies virus in cats and dogs was not identified prior to 3 days before onset of illness. The longest durations from the first salivary excretion of rabies virus to death in the animals in the studies by Vaughn and colleagues^{6,7} and Fekadu et al.¹⁰ were 7 and 9 days, respectively. Studies using modern molecular diagnostic methods might be able to tell us more about salivary virus excretion but would be difficult to perform. We did not encounter a dog that developed rabies after being released from observation.

CONCLUSIONS

The authors conclude that the observation for signs of Rabies in a dog for 10 days with five clinical features can be an aid for an early presumptive diagnose of rabies in live dogs. It should not be used as sole basis for treatment decisions of a possibly rabies exposed patient. It can, however, help the physician, veterinarian and public health official to prioritize treatment and to decide whether sacrificing and laboratory examination of the dog is indicated.

A healthy domestic dog, cat, or ferret that bites a person should be confined and observed for 10 days^{13,14,15}. Those animals remaining alive and healthy for 10 days after a bite would not have been shedding rabies virus in their saliva and would not have been infectious at the time of the bite^{16, 17} so

post exposure antirabies treatment could be stopped but even if a pet and vaccinated animal dies with natural or unnatural death within 10 days of bite or exposure, the full schedule of anti rabies treatment should be completed diligently.

There is a great need for close cooperation between veterinary and medical professionals for rational decision making when confronted with rabies exposures.

We conclude that our study supports the current WHO¹¹ recommendations for 10 days of observation of dogs and cats suspected of having rabies.

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