

## SYMPTOMS AND INCUBATION PERIODS OF RABIES IN ANIMALS

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### ABSTRACT

**During progression of rabies, the issues of incubation period as well as symptoms retain ambiguity since long. While different incubations periods have been reported by various workers, like wise varied clinical signs have been reported in different species of animals. The present review throws light on the reports of incubation periods as well as varied signs and symptoms in rabid animals as reported by various workers.**

**KEYWORDS:** Incubation, Rabies, Symptoms

Rabies is characterised by a long and variable period from 10 to 209 days in animals (Debbie, 1974). The appearance of overt disease is usually preceded by a prodromal period in which there are a number of non-specific symptoms of malaise (Bishop, 1979). In a study of rabies symptoms (Srinunthapanth et al., 1985) nine cattle and a buffalo exhibited anorexia, hypersalivation, constipation, conjunctivitis corneal opacity and nervous symptoms. In experimental rabies in sheep, produced by street rabies virus of fox origin by intra-muscular route, symptoms mainly included refusal to eat and drink, paresis, paralysis, muscular tremors and death ensuing in 2-4 days. (Baltazar et al., 1986).

Hind limb hyperesthesia is observed in rabid horses (Meyer, 1963). Okolo (1986) reported recumbency, dropped jaw, dyspnoea, ataxia, salivation, conjunctival congestion and glazed eyes in dogs with dumb rabies. Two calves inoculated with street rabies virus stopped growing after 2 weeks (Torres Anjel et al., 1986). Intracerebrally infected striped skunks developed clinical signs of aggression, posterior ataxia hyper-excitability and paralysis after 20-62 days (Bundza and Charlton, 1988).

Fekadu (1988) studied the development of symptoms and excretion of rabies virus in dogs experimentally infected by street virus. It was found that most dogs showed clinical signs of rabies before death. However 18% of dogs died without sign of illness and in 20% dogs showing signs, rabies was not always fatal. Dogs excreted virus in their saliva up to 14 days before appearance of signs.

In another study, body weight changes and immuno-histotopography of thymus and spleen were studied in weaning rat model to assess the wasting syndrome and acquired immuno-deficiency syndrome in rabies infection (Toress Anjel et al., 1988).

Revesz (1988) has reported the occurrence of dumb, paralytic rabies in cattle. In experimental rabies in sheep and foxes produced by street rabies virus of bat origin, by intra-muscular route, one of the sheep and three of five foxes developed signs of rabies (Soria Baltazar et al., 1988). Early general or digestive-tract signs (ruminal atony) often with marked behavioral changes (a typical attentiveness to people and sexual arousal) preceded a wide range of marked neurological signs (rage, spasms, partial paralysis of the tongue, and later on hindquarters or bladder) in 41 cases of cattle, (Tanyi et al., 1988).

Nine dogs were inoculated by street rabies virus associated with acute convulsive rabies. Six of them died after 2-9 days of illness. (Gribencha et al., 1989a). Kandavel et al., (1989) in a study of 29 cases of rabid calves has reported 20 calves with furious form, 5 with paralytic form while four cases could not be classified as either. Schulz (1989) has reported the symptomatology in a study of 219 cases of cattle, wherein 26% had furious form, 21% had dumb form and the rest had intermediate forms.

Out of three groups of 50 mice each inoculated with rabies virus, only 32 mice developed clinical signs of rabies. Likewise, out of 6 guinea pigs, 5, 6 and 5 developed clinical signs after inoculation by dog strain, jackal strain

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and buffalo strain respectively (Madhusudana and Aggarwal, 1991). Five cattle inoculated with  $50 \times 10^6$  LD<sub>50</sub> of street virus of bat origin died of rabies (Romero et al., 1991). Rabid horses showed ataxia, paresis of hind quarter, lameness, recumbency, pharyngeal paralysis, colic, loss of tail and anal sphincter tone and fever (Green et al., 1992). 12 raccoons inoculated with rabies virus of skunk origin survived the 92 day observation period and none exhibited the behavioral changes classically associated with clinical rabies virus infections (Hill and Beran; 1992).

Afzal et al., (1993) has recently reported the

rabies symptom in 7 cases of camels wherein hyperexcitability, attacking inanimate objects, self-biting of forelimbs, colic, drooling of saliva, internal recumbency and paralysis of hind limbs has been reported.

Incubation periods observed in different experimental studies in various species by employing specific strain of virus in a known dose and by a fixed route have been summarised in Table 1 along with the respective references.

**Table 1: Incubation periods observed in different experimental studies in various species by employing specific strain of virus in a known dose and by a fixed route**

Species	Strain	Dose	Incubation Period	Route	Reference
Mice	CVS	MICLD <sub>50</sub> 107.5/ 0.03ml	7 days	Oral	Madhusudana & Tripathi, (1990)
G.pig	Street	MICLD <sub>50</sub> 106.5/ 0.03ml	21 days	Oral	Madhusudana & Tripathi, (1990)
Sheep	Street	-	30 Daye	i/m	Soria Baltazar et al.,(1988)
Dog	Street	3 million MICLD <sub>50</sub> /0.03ml	5-8 Days	i/cerebral	Gribencha et al., (1989a)
Cat	Street	-	42 Days	i/m	Trimarchi et al., (1986)
Dog	Street	-	14 Days	i/m	Aghomo et al., (1990)

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