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Early Detection of Rabies in Dogs and Other Animals: Recognizing Behavioral Changes and Clinical Progression for Effective Dog Bite Prevention - Part I

This is the first article of two in a series on "Early Detection of Rabies in Dogs and Other Animals: Recognizing Behavioral Changes and Clinical Progression for Effective Dog Bite Prevention"

Rabies is a deadly, zoonotic disease caused by a neurotropic virus of the Rhabdoviridae family that primarily affects the central nervous system of mammals. Dog bites and scratches account for 99% of human rabies cases, and the disease can be largely prevented through dog vaccination and bite prevention. Once clinical signs appear, rabies is almost always fatal, making early detection of rabies in dogs and prevention of dog bites crucial for prevention and control. Recognizing symptoms of rabies in dogs, such as aggression, excessive salivation, and paralysis, is important for preventing transmission to humans. However, early and subtle behavioural changes in animals are often overlooked, yet they can serve as crucial warning signs for timely intervention.

Rabies is primarily transmitted through the bite of an infected animal, with the virus present in saliva. It can also be transmitted through scratches or direct contact of infected saliva with mucosa (e.g. eyes, mouth) or open wounds. The incubation period in animals can range from a few weeks to several months. In dogs and cats, the incubation period is typically less than 6 months, with most cases occurring between 2 weeks and 3 months after exposure. This period can vary depending on the site of the bite and the amount of virus introduced. Animals such as dogs and cats typically develop symptoms and die within a short period; usually 10 to 14 days — once the virus reaches the brain, especially if the animal was already infectious (i.e., the virus was present in its saliva) at the time of the bite. This forms the basis for the standard 14-day observation period for animals following a bite.

In humans, the incubation period varies, with about 75% of cases falling between 3 weeks and 3 months. However, it can be as short as a few days or extend to several months. This relatively long incubation period in the majority offers a critical window for initiating post-exposure prophylaxis (PEP).

Early recognition of symptoms in animals, even when subtle — can trigger timely PEP for exposed individuals, and help prevent human exposure and reduce the spread of the virus within animal populations.

Clinical findings of rabies in animals

Clinical signs of rabies in animals can vary, but there are common neurological symptoms that suggest rabies infection. Regardless of species, the most reliable signs of rabies are:

- **Acute behavioural changes:** Rabies trigger sudden behavioural shifts, such as aggression in a normally docile animal or increased violence in an already aggressive one.
- **Progressive paralysis:** One of the key features of rabies is the gradual onset of paralysis. This usually begins with difficulty swallowing and progresses to complete paralysis, ultimately leading to death.

Early symptoms of rabies in dogs

The onset of rabies in dogs is marked by subtle behavioural changes. The prodromal phase, lasting approximately 1–3 days, is the first stage of the disease, during which animals exhibit non-specific symptoms that rapidly worsen. Early signs can include:

- **Apprehension or nervousness:** Dogs may appear uneasy, retreating into corners or seeking isolation.
- **Irritability and hyper-excitability:** A normally calm dog might suddenly become easily agitated, responding aggressively to minor stimuli.
- **Loss of appetite (anorexia):** Affected dogs may stop eating, a common indicator of illness.

1. Early Detection of Rabies in Dogs and Other Animals: Recognizing Behavioral Changes and Clinical Progression for Effective Dog Bite Prevention - Part I 1
2. Summary of selected notifiable diseases reported (15th – 21st Mar 2025) 3
3. Surveillance of vaccine preventable diseases & AFP (15th – 21th Mar 2025) 4

- **Behavioural changes:** Dogs may show uncharacteristic aggression, becoming vicious or excessively playful without provocation. Normally nocturnal animals may begin to display daytime activity, which is atypical for their species

These early signs of rabies can be subtle, and owners might mistake them for common behavioural issues or other illnesses. However, as the disease progresses, these symptoms intensify, making it critical to recognize them early. Identifying these signs helps individuals avoid potentially dangerous interactions, reducing the risk of bites.

How rabies progresses in dogs

Rabies progresses through three general phases: the prodromal, acute excitative (furious), and paralytic phases. The speed and severity of these phases can vary depending on the individual animal and the strain of the virus.

1. **Prodromal phase:** This initial phase lasts 1–3 days and is characterized by nonspecific behavioural changes, such as irritability, nervousness, and decreased appetite. These signs may intensify rapidly.

2. **Acute excitative (furious) phase:** The furious form of rabies is marked by severe aggression, with animals attacking readily, often without provocation. There is no paralysis during this phase. Infected animals appear anxious, with dilated pupils, and lose their natural fear of humans and other animals. They may roam extensively and attack other animals, humans, or moving objects. Some may ingest non-food objects such as sticks, and stones, or even attempt to chew through fences or cages. Infected dogs may lose their usual fear of humans and other animals, increasing the risk of unpredictable aggression and bites. This phase is often referred to as "mad dog syndrome."

2. **Paralytic (dumb) phase:** As the virus affects the nervous system, paralysis sets in. Dogs in this stage may exhibit muscle weakness, difficulty swallowing, and excessive salivation. The inability to swallow, coupled with foaming at the mouth, is a hallmark sign of rabies in dogs. The paralysis progresses rapidly, leading to coma and death.

As rabies advances, it can cause severe respiratory issues, making breathing difficult and causing choking sensations. Eventually, the nervous system deteriorates progressively, leading to death. It is essential for pet owners to be vigilant and recognize these signs promptly to seek immediate medical attention.

Behavior of rabid puppies: from subtle signs to severe aggression

In puppies, rabies may not initially present with the pronounced aggression typically observed in adult dogs, making early recognition more difficult. The early symptoms can be subtle. Initially, affected puppies may continue to seek human companionship, appearing overly affectionate or playful. However, within a few hours, this behaviour can escalate to unprovoked biting, even when being petted. As the infection progresses, they may become increasingly irritable and respond aggressively to minimal provocation, using their teeth, claws, or paws to attack. Dilated pupils, alert posture, and anxious expression are also characteristic features. They may lose their natural fear of humans and other animals and react to sound or movement with sudden aggression. In the furious form of rabies, these young animals may roam, attack other animals or people, and even swallow non-food objects such as faeces, straws, or stones. Some may attempt to bite through cage wires or follow and snap at hands moving near them. These behavioural changes often go unrecognized in the early phase but rapidly worsen, making rabid puppies a significant public health concern due to their close contact with humans. Early recognition and caution are essential.

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 To be Continued...

Table 1: Selected notifiable diseases reported by Medical Officers of Health 15th – 21st Mar 2025 (12th Week)

RDHS	Dengue Fever		Dysentery		Encephalitis		En. Fever		F. Poisoning		Leptospirosis		Typhus F.		Viral Hep.		H. Rabiies		Chickenpox		Meningitis		Leishmania-		Tuberculosis		WRCD	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	T*	C**
Colombo	242	2849	0	11	0	3	0	3	0	5	5	112	0	4	1	5	0	0	20	146	1	18	0	1	47	477	100	100
Gampaha	125	1820	1	15	1	14	0	1	2	44	12	191	3	5	0	5	0	0	17	221	3	34	0	14	25	249	100	100
Kalutara	35	457	0	10	0	1	0	2	0	13	12	174	0	0	0	2	0	0	26	179	0	10	0	1	18	168	100	75
Kandy	59	775	1	19	0	2	2	4	2	8	3	84	1	19	0	5	0	0	12	113	2	9	0	22	12	188	100	100
Matale	20	427	0	8	0	1	0	0	8	14	3	52	0	1	0	4	0	0	6	39	0	1	6	68	3	37	100	100
Nuwara Eliya	6	56	1	24	0	3	0	4	0	44	3	40	0	18	0	0	0	0	5	67	0	6	0	0	3	73	92	100
Galle	35	529	1	19	0	2	0	0	0	26	28	230	1	27	0	4	0	0	20	211	5	48	0	1	11	123	95	100
Hambantota	18	248	0	6	0	2	0	0	0	3	8	110	1	14	0	1	0	0	11	123	0	4	1	75	0	42	100	100
Matara	30	432	0	4	0	2	0	1	0	3	13	136	0	7	0	2	0	0	16	113	0	13	2	27	1	47	100	100
Jaffna	25	442	5	24	0	1	0	3	0	11	1	108	18	232	1	1	0	1	11	91	0	9	0	0	7	46	100	93
Kilinochchi	0	39	0	5	0	0	0	4	1	2	4	43	0	10	0	1	0	0	0	1	0	0	0	0	3	10	100	100
Mannar	2	77	0	0	0	0	0	0	0	1	2	12	1	5	0	0	0	0	1	12	0	9	0	0	1	12	100	100
Vavuniya	1	24	0	5	0	0	0	1	0	20	3	33	0	2	0	0	0	0	1	11	1	6	1	7	2	10	100	100
Mullaitivu	0	24	0	1	0	0	0	1	0	0	2	35	1	4	0	0	0	0	0	7	0	4	0	0	0	6	100	100
Batticaloa	28	692	2	62	0	8	0	0	10	70	1	28	0	1	0	9	0	0	1	70	3	18	0	1	3	39	14	100
Ampara	3	48	0	6	1	2	0	0	0	2	6	50	0	1	0	1	0	0	6	41	2	6	2	9	2	17	29	100
Trincomalee	23	322	0	19	0	1	0	0	0	16	1	49	0	5	0	2	0	0	3	34	0	7	0	3	0	19	8	100
Kurunegala	21	305	0	7	3	7	0	1	0	19	14	223	1	16	0	1	1	1	20	236	3	40	19	146	10	95	100	100
Puttalam	10	259	1	9	0	0	0	0	0	4	5	105	3	21	0	1	0	0	4	49	0	26	0	7	0	48	92	100
Anuradhapura	8	249	4	18	0	5	0	1	0	7	3	152	0	11	1	6	0	0	8	82	1	29	6	204	9	71	96	100
Polonnaruwa	6	68	0	7	0	2	0	1	1	2	6	64	0	0	1	9	0	0	3	50	0	2	10	106	5	19	100	92
Badulla	6	218	3	9	1	2	0	3	0	0	9	96	0	8	1	11	0	0	8	124	1	25	2	9	4	60	94	100
Monaragala	24	237	0	6	0	3	0	0	0	3	21	166	0	19	0	4	0	0	3	42	0	16	0	38	1	27	73	100
Ratnapura	56	624	1	28	0	4	0	3	1	13	45	426	0	12	0	2	0	0	8	135	6	43	1	38	11	111	90	100
Kegalle	32	348	2	23	0	3	0	0	1	15	12	177	1	5	0	6	0	0	22	239	7	23	0	11	8	70	100	100
Kalmunai	6	144	0	7	0	0	0	0	0	7	0	37	0	1	0	1	0	0	3	51	1	8	0	0	4	31	8	100
SRILANKA	**821**	**11713**	**22**	**352**	**6**	**68**	**2**	**33**	**26**	**352**	**222**	**2933**	**31**	**448**	**5**	**83**	**1**	**2**	**235**	**2487**	**36**	**414**	**50**	**788**	**190**	**2095**	**84**	**99**

Source: Weekly Returns of Communicable Diseases (esurvillance.epid.gov.lk). T=Timeliness refers to returns received on or before 21st Mar, 2025 Total number of reporting units 361 Number of reporting units data provided for the current week: 358 C**-Completeness

A = Cases reported during the current week. B = Cumulative cases for the year.

Table 2: Vaccine-Preventable Diseases & AFP

15th – 21st Mar 2025 (12th Week)

Disease	No. of Cases by Province									Number of cases during current week in 2025	Number of cases during same week in 2024	Total number of cases to date in 2025	Total number of cases to date in 2024	Difference between the number of cases to date in 2025 & 2024
	W	C	S	N	E	NW	NC	U	Sab					
AFP*	00	00	00	00	00	00	00	00	00	01	02	15	18	-16.6%
Diphtheria	00	00	00	00	00	00	00	00	00	00	00	00	00	0 %
Mumps	01	01	00	00	00	00	01	00	04	07	05	63	69	-8.7 %
Measles	00	00	00	00	00	00	00	00	00	00	10	01	168	-99.4%
Rubella	00	00	00	00	00	00	00	00	00	00	00	00	01	-100%
CRS**	00	00	00	00	00	00	00	00	00	00	00	01	00	0 %
Tetanus	00	00	00	00	00	00	00	00	00	00	00	02	00	0 %
Neonatal Tetanus	00	00	00	00	00	00	00	00	00	00	00	00	00	0 %
Japanese Enceph-alitis	00	00	00	00	00	00	00	00	00	00	00	04	01	300 %
Whooping Cough	00	00	00	00	00	00	00	00	00	00	00	08	01	700 %

Key to Table 1 & 2

Provinces: **W**: Western, **C**: Central, **S**: Southern, **N**: North, **E**: East, **NC**: North Central, **NW**: North Western, **U**: Uva, **Sab**: Sabaragamuwa.

RDHS Divisions: **CB**: Colombo, **GM**: Gampaha, **KL**: Kalutara, **KD**: Kandy, **ML**: Matale, **NE**: Nuwara Eliya, **GL**: Galle, **HB**: Hambantota, **MT**: Matara, **JF**: Jaffna, **KN**: Killinochchi, **MN**: Mannar, **VA**: Vavuniya, **MU**: Mullaitivu, **BT**: Batticaloa, **AM**: Ampara, **TR**: Trincomalee, **KM**: Kalmunai, **KR**: Kurunegala, **PU**: Puttalam, **AP**: Anuradhapura, **PO**: Polonnaruwa, **BD**: Badulla, **MO**: Moneragala, **RP**: Ratnapura, **KG**: Kegalle.

Data Sources:

Weekly Return of Communicable Diseases: Diphtheria, Measles, Tetanus, Neonatal Tetanus, Whooping Cough, Chickenpox, Meningitis, Mumps., Rubella, CRS,

Special Surveillance: AFP* (Acute Flaccid Paralysis), Japanese Encephalitis

CRS =**Congenital Rubella Syndrome

NA = Not Available

Number of Malaria Cases Up to End of March 2025,

04

All are Imported!!!

Comments and contributions for publication in the WER Sri Lanka are welcome. However, the editor reserves the right to accept or reject items for publication. All correspondence should be mailed to The Editor, WER Sri Lanka, Epidemiological Unit, P.O. Box 1567, Colombo or sent by E-mail to **chepid@sltnet.lk. Prior approval should be obtained from the Epidemiology Unit before publishing data in this publication**

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