



## **Polioencephalomalacia in goats – A study of 24 cases**

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### **Abstract**

In Veterinary Dispensary, Alundur, Trichy, Tamil Nadu, about twenty-four goats were presented over the period of 7 months with the history of neurological signs. The clinical examination revealed signs including staggering gait, incoordination, torticollis, nystagmus and apparent blindness. The animals were found anorectic. These goats were diagnosed as affected with Polioencephalomalacia. Those animals were treated with thiamine (@ 10mg/kg intravenous) and Dextrose normal saline (10ml/kg intravenous) on every day and dexamethasone (0.5mg/kg intramuscular) on alternate days till recovery. Out of twenty-four affected goats, eighteen goats responded earlier and recovered completely in 3-4 days of treatment. The four goats showed delayed recovery i.e. about after 7 days of therapy. Thus twenty-two cases with neurological signs were recovered with the above protocol of treatment. Two goats did not respond well to the treatment and they were culled by the owner.





**Keywords:** Polioencephalomalacia, Goat, staggering gait, Thiamine deficiency

### **Introduction**

Thiamine (Vitamin B1) is an essential nutrient for ruminants and other mammals. Thiamine serves as a cofactor of enzymes, including transketolase, -ketoglutarate dehydrogenase, pyruvate dehydrogenase, and branched chain -keto acid dehydrogenase, thereby, plays a critical role in carbohydrate metabolism. Thiamine also has specific roles in neuronal communication, immune system activation, signaling and maintenance processes in cells and tissues [1]. Microbial thiamine synthesis in the rumen is the main source for thiamine apart from feed sources. Polioencephalomalacia (PEM), is an important neurological disease process that occurs due to deficiency of thiamine and could affect many species of ruminants and contributes to substantial economic loss to livestock industry [2].

### **Case History and clinical examination**

From the month of January 2019 to July 2019, about twenty-four goats that are presented to the Veterinary Dispensary, Alundur, Trichy, with the history of neurological signs such as sudden paralysis of limbs, excitability, head pressing, circling movements and muscular tremors with weakness of all extremities. Goats were unable to stand without support (Fig 1). The history also revealed, all the animals were fed boiled rice regularly. On clinical examination, some goats showed apparent blindness (in 2 animals), became recumbent with torticollis (16 animals) and extended limbs (Fig 2), opisthotonus posture and started paddling movements in 12 animals (Fig 3). When these animals were turned and positioned at on other side of lateral recumbency, they attempted and rolled back to the same position with head turned upwards. Temperature and respiratory rate were found normal. Rumen motility was decreased to 1 per 2 minutes.

	
<p>Recumbent animal with extended hind limbs (Fig 1)</p>	<p>Torticollis (Fig 2)</p>
	
<p>Paddling movements (Fig 3)</p>	<p>Recovered Animal standing independently (Fig 4)</p>

## Diagnosis and Treatment

On the basis of symptoms, thiamine deficiency, listeriosis, tetanus, enterotoxemia, blood parasitic infestation and pregnancy toxemia were suspected. Diagnosis was based on clinical examination and history of feeding boiled rice regularly. These cases were treated with thiamine (@ 10mg/kg intravenous) and dextrose normal saline (10ml/kg intravenous) everyday along with dexamethasone (0.5mg/kg IM) was given on alternate days till recovery. Following treatment with thiamine, the severity of the clinical signs reduced. The administration of Dexamethasone was recommended to decrease edema and inflammation of the brain. Out of twenty-four affected goats, eighteen goats responded earlier and recovered completely in 3-4 days of treatment (Fig 4). The four goats showed delayed recovery i.e. about after 7 days of therapy. Two goats did not recover and the owner had disposed the animal.

## Discussion

Highly grain-fed ruminants have sub-acute ruminal acidosis (SARA) wherein, thiamine produced in the rumen could be degraded by the thiaminases produced by *Bacillus sp.*, *Clostridium sporogenes* and also decreased thiamine absorption by transporters [3]. Lower levels of thiamine would promote a lower supply of carbohydrates to the nerve cells, leading to central nervous disorders polioencephalomalacia and death [2]. All the goats under the present study were found to be fed with rice and it could be the potential reason for excessive carbohydrate in the rumen with resultant thiamine deficiency. Animals of all ages could be affected but young animals appeared to be more vulnerable. Several risk factors such as thiamine deficiency, sulfur toxicity, lead toxicity, and water deprivation- sodium ion toxicity had been involved in the development of polioencephalomalacia. All these factors produced similar brain lesions. Regardless of

the suspected, cause of polioencephalomalacia affected animals frequently respond to thiamine administration [4]. Pan et al., (2018) stated that thiamine deficiency could be reversed by exogenous thiamine supplementation in the diet. Similarly, in the present study, the animals were recovered with optimum thiamine supplementation. The two animals without recovery might be due to its delayed presentation and initiation of treatment.

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