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Simultaneous occurrence of cerebrospinal nematodiasis and *Setaria microfilaraemia* in cross bred goats from Assam (India)

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Abstract

The present communication describes a neurological disorder characterized by appearance of clinical symptoms like muscular weakness, unsteady gait, paresis of hind legs and lateral recumbency in two adult female cross-bred goats from a flock raised at the Lakhimpur College of Veterinary Science, North Lakhimpur, Assam. The affected goats with normal body temperature were unresponsive to initial heat therapy and neuro-stimulant administration. Subsequent blood examination by Knott's technique revealed presence of sheathed microfilariae. Administration of diethyl carbamazine citrate (DEC) @ 100mg per os daily for 5 days and Tribivet-M @ 1.5 ml i/m every alternate day for 7 occasions led gradual resolution of clinical symptoms and complete recovery.

Based on clinical observation, laboratory finding and response to treatment it was concluded that the two goats suffered from cerebrospinal nematodiasis, an unusual condition caused by erratic migration of the larval stage of *Setaria digitata* transmitted from its natural host cattle by mosquitoes. Detection of microfilariae in blood is also a rare finding.

Keywords: *Setaria*, microfilaria, Kumri, Goat, Knott's technique

Introduction

Cerebrospinal nematodiasis or kumri, a neurological disorder of aberrant hosts such as sheep, goat and horse [1, 2] is caused by the larval stage of *Setaria digitata* which when migrates erratically in the central nervous system. Different species of mosquitoes under *Aedes*, *Culex* and *Anopheles* genera are the known intermediate hosts of this filarid nematode and transmit the infection to different hosts during blood sucking. Cattle and buffaloes are the natural hosts of this parasite, the adult stage of which is found in the peritoneal cavity and larval stage (microfilaria) in the circulating blood. The adult worms in their usual site of predilection are considered to be non-pathogenic although heavy infection may produce mild fibrinous peritonitis [3, 4]. The parasite is also reported to occur in the eyes of the natural host and causes ocular setariosis, a condition characterized by lachrymation, corneal opacity and conjunctivitis [5, 6, 7]. There was even documentation of the parasite discharge in the urine of a bullock [8] and record in the bovine foetus through prenatal infection [3, 9].

Setaria digitata is reported to be the commonest filarid nematode found in the peritoneal cavity of cattle and buffaloes in India [10]. Occurrence of unnatural infection of goats by the larval stage of this parasite has also been reported from India and its neighbouring countries [2, 11, 12]. The objective of the present communication was to report two cases of cerebrospinal nematodiasis and therapeutical outcome in goats from Assam (India).

Materials and Methods

Two adult female cross-bred goats (Assam local x Beetal) from a flock of Assam local and cross-bred goats raised in the livestock farm complex of the Lakhimpur College of Veterinary Science, Assam Agricultural University, Joyhing were presented with history of muscular weakness, unsteady gait, imbalanced walk and gradual paresis of hind legs in a span of 2-3 days for treatment at the Teaching Veterinary Clinical Complex of the institute. One of the two

affected goats finally developed complete lateral recumbency (Fig. 1). Physical examination revealed normal body temperature in both the animals, rough body coat and shivering in addition to the above abnormalities. The animals were unresponsive to infrared lamp heat therapy and neurostimulant administration. Blood from the sick animals were collected in EDTA tubes for haemoparasite detection by Giemsa stained blood smear examination and Knott's technique [13]. Upon detection of microfilariae, the animals were treated with diethyl carbamazine citrate (DEC) in the form of Banocide tablet 100mg per os daily for 5 days and Tribivet-M injection @ 1.5ml intramuscularly every alternate day for 7 occasions.

Results and Discussion

Blood samples of the two animals when examined by Knott's technique were found positive to sheathed microfilariae (Fig. 2). However, Giemsa stained smears remained negative for any parasite. The animals responded to parasite specific treatment and recovered fully with normal gait and appetite within a week (Fig. 3). Neurological symptoms accompanied with microfilaraemia were suggestive of the condition indistinguishable from cerebrospinal nematodiasis as usually reported elsewhere in goats [1]. Positive response to DEC treatment and vitamin supplementation as observed in the present cases corroborated with therapeutic observations reported earlier elsewhere [11, 12, 14]. Cattle and buffaloes in India are known to be commonly infected with *Setaria digitata* [10, 15]. Proximity of the goats to the surrounding cattle population and abundance of mosquitoes with the onset of rainy season might have predisposed the animals to the infection which led to a clinical condition [16, 17]. Occurrence of the disease usually in adult goats of more than 12 months of age [11, 18] corroborates the present cases of above one year age. No incidence of the disease was reported earlier in the Assam local goats from the place of present reporting. Detection of clinical disease in recently introduced crossbred goats might suggest genetic constitution or immunological condition to play role in production of the disease as opined by several authors [17, 18, 19]. Detection of microfilariae in blood of the two affected goats in the present observation agreed to the findings of authors elsewhere [19] who could observe microfilariae in the blood and also recover adult parasites from the peritoneal cavity in a small proportion of adult goats at slaughter. However, there was no any evidence of lesion in the visceral organs including brain or ante mortem clinical sign as observed in the present two cases. Thus, detection of microfilaria in the present observation indicated development of mosquito transmitted larval stage in the peritoneal cavity of the goats. *Setaria cervi* which is known to occur normally in the peritoneal cavity of deer has been reported to cause cerebrospinal setariosis by aberrant migration of microfilaria in the nervous system of affected hosts [20, 21]. Besides *Setaria digitata*, there are also reports of occurrence of *Setaria cervi* in the peritoneal cavity of cattle [10] and goats [22]. The sheathed microfilariae observed in the blood of the present two cases were identified to be of *Setaria*. However, species identification could not be done in absence of the adult stage of the parasite. Simultaneous occurrence of neurological disorder suggestive for erratic migration of larval stage of *Setaria* and microfilaraemia observed in the two goats reported here in similar to that of deer [20, 21] was a rare finding.

Hence, this study may provide information regarding the

prevalence of adults and microfilaria of *Setaria* species in the area of study which will help the veterinarians to treat the cases in more specific manner.



Fig 1: Goat with nerve symptom (Pre treatment)



Fig 2: Blood samples of the animal found positive to sheathed microfilariae



Fig 3: Goat at recovery stage (Post treatment)

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