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Case Study

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Sporadic Incidence of Cutaneous Theileriosis in a Cross Bred Cow – A Case Report

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A B S T R A C T

Theileriosis is one of the major tick borne diseases endemic in India. A four year cross-bred dairy cow with history of anorexia, bilateral watery nasal discharge, pyrexia, cutaneous nodules was reported to Veterinary Clinical Complex, Veterinary College and Research Institute, Namakkal for treatment. On clinical examination the animal had pyrexia, bilateral adenopathy of prescapular lymph node, generalised cutaneous nodules, salivation and pale mucous membrane. Confirmatory diagnosis of theilerioisis was done by detection of piroplasms and schizonts (Koch's blue bodies) in Giemsa stained blood and lymphnode aspirate smears respectively. Haemogram of the animal revealed severe anaemia. Treatment of animal with combination of buparvoquone and oxytetracycline with supportive treatment resulted in clinical recovery with resolvement of cutaneous nodules.

Introduction

Tick borne diseases affect domestic animals, predominantly cattle followed by sheep and goats in tropical countries of the world. Theileriosis is one among these caused by the protozoan genera Theileria. Theileria species that infect bovines include *T. annulata*, *T. parva*, *T. mutans*, *T. orientalis* complex (orientalis/sergenti/buffeli), *T. tarurotragi*, *T. velifera*, *T. sinensis* and *Theileria* sp. Yokoyama, a newly discovered Theileria species closely related to *T. annulata* (Sivakumar *et al.*, 2019). *Theileria annulata*, the causative agent of tropical bovine theileriosis, is regarded as the most pathogenic Theileria species with worldwide distribution and transmitted by *Hyalomma anatolicum*, a three host tick acting as biological vector (Anupama *et al.*, 2015). Fever, lethargy, lymphadenopathy, jaundice, anaemia, tachycardia, tachypnea, ocular discharge, abortion are the common clinical signs associated with theileriosis in dairy animals and rarely presence of cutaneous nodules (Khatoon *et al.*, 2013). Tropical theileriosis is the major limiting factor in the development of dairy industry in India due to huge economic losses in relation to high mortality and morbidity and loss of USD

384.3 million per annum in India (Rajendran and Ray, 2014). Asian countries particularly India, china, Africa and Europe are endemic for tropical theileriosis. This paper describes a sporadic incidence of cutaneous theileriosis and its clinical management in dairy cattle.

Materials and Methods

A four year cross-bred dairy cow with history of anorexia, bilateral watery nasal discharge, pyrexia, cutaneous nodules was reported to Veterinary Clinical Complex, Veterinary College and Research Institute, Namakkal for treatment. On clinical examination the animal had pyrexia, bilateral prescapular lymphadenopathy, generalised cutaneous nodules, salivation and pale mucous membrane. Blood sample was collected aseptically from jugular vein of affected animal and immediately transferred to ethylenediamine tetra aceticacid (EDTA) vials for haemogram. Peripheral blood smears and lymphnode aspirates were collected from the margin of the ear vein and pre scapular lymphnodes, respectively. Prepared smears were stained by Giemsa staining as per the method described by Sahoo *et al.,* (2017). Microscopic examination of Giemsa stained blood smears and lymph node aspirate smears under 1000 X magnification revealed the presence of piroplasms and schizonts (Koch's blue bodies) in the lymphoblasts which confirmed that the animal is affected with theileriosis.

After confirmation, buparvoquone @ of 3.5 mg/kg body weight (intramuscularly (i/m) (Butalex^{TM}, MSD Animal Health, Ahmedabad, India), oxytetracycline @ of 20 mg/kg body weight (Steclin, Zydus Animal Health, Uttarakhand) intravenously with normal saline, flunixin meglumine @ of 1.1 mg/kg body weight (i/m) (Megludyne, Virbac Animal Health India, Maharastra, India), ivermectin @ 0.2 mg/kg body weight subcutaneously (Neomec, Intas Pharmaceuticals, Ahmedabad, India) and supportive treatment with Belamyl^{TM} (15 ml, i/m, B complex liver extract with Vitamin B12 Injection, Zydus, India) were administered and the therapeutic regimen was followed for seven days except buparvoquone and ivermectin. To enhance the haemoglobin level of animal and to sustain the level of rumen microflora, ferritas bolus (Iron, folic acid, Vitamin B12, Intas Pharmaceuticals, Ahmedabad, India, 2 boluses once daily) and Yeasacc bolus (Alltech biotechnology private limited, Karnataka 2 boluses, Per os, twice daily) were given orally for 14 days. Progressive clinical improvement was noticed with disappearance cutaneous nodules after 19 days.

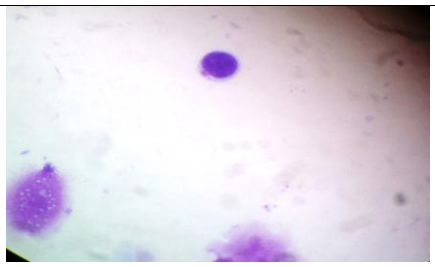
Results and Discussion

Bovine theileriosis is of great concern due to its impact on the health and productivity of farm animals in India. Etiological agent of this disease is a tickborne obligatory intracellular protozoa of the genera Theileria, transmitted by Ixodid ticks having a complex life cycle in vertebrate and invertebrate hosts (Nejash and Tilahun, 2016). There are various species of Theileria affecting livestock and most common species endemic in India is *Theileria annulata*, causal factor of tropical theileriois commonly transmitted by arthropod vector *Hyalomma anatolicum* (Salih *et al.,* 2015). Infection of dairy animal with *Theileria* spp. in the present study was detected by the presence of *Theileria* piroplams and schizonts (Koch's blue bodies) in Giemsa stained blood smear and lymphnode aspirate smear respectively. Clinical signs presented in the cattle are in concurrence with the findings of Kumar *et al.*, (2019) who reported that pyrexia, pale mucous membranes, anaemia, conjunctival petechiae, enlargement of superficial lymphnodes and hyporexia/anorexia in bovine

theileriosis. In addition to the conventional clinical findings, cutaneous nodules were also noticed in the animal which is a very rare sign of bovine theileriosis (Gharbi *et al.,* 2017). Even though bovine theilerioisis cases were frequently reported to Veterinary Clinical Complex, Veterinary College and Research Institute, Namakkal, India, this is a peculiar case with uncommon cutaneous lesions. He also reported that cutaneous lesions due to *T. annulata* infection, including nodular, haemorrhagic and/or necrotic lesions in cattle and buffaloes in different regions of the world. Scanty reports of this unusual form of Theileriosis were reported in India, including Narang *et al.,* (2019) who evidenced subcutaneous nodular masses in cross-bred cow in Punjab state of India. Reduced haemoglobin (7.6 mg/dl) and reduced packed cell volume (22%) are the clinico pathological features associated with degenerative anaemia in Theileriosis (Col and Uslu, 2006).

Plate.1. Cutaneous lesions in cow affected with cutaneous theileriosis

Plate. 2. Schizonts (Koch's blue bodies) in Lymphocyes



The animal was treated with buparvoquone as it is drug of choice for the therapeutic management of all forms of theileriosis (Kumar *et al.,* 2019) with oxytetracycline and supportive treatment for seven days. Nagar *et al.,* (2019) recommended that combination of buparvoquone and oxytetracycline with haematinics and multivitamins can be used as a successful treatment regimen and uneventful recovery of theileriosis affected cow which was also observed in the present study. In endemic regions acuteness of the disease depends upon multiple factors including susceptibility of the host, virulence of the parasite and quantity of parasites injected by the arthropod vector (Vasudev *et al.,* 2014). But animals with low infectivity remain undiagnosed and continue to be a constant source of infection for other susceptible hosts (Sahoo *et al.,* 2017). Hence, identification and culling of carrier animals based on periodical screening using suitable diagnostic tests, vector/tick control, selection of tick resistant breeds of cattle, effective therapeutic management of affected animals and regular vaccination of susceptible animals with vaccine (*Theileria schizont* vaccines) are the best recommended strategies for prevention of bovine theilerisois.

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