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THEILERIA IN CATTLE: A CASE STUDY

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Abstract: Theileria, one of the leading causes of blood protozoa, has caused a significant economic loss to the global livestock industry. This study deals with the clinical signs, diagnosis, and treatment of disease. The presented animal was four years old, and clinical indicators included a high temperature (105F), anorexia, enlarged lymph nodes, dyspnea, and ocular discharge with pale mucous membranes. A peripheral blood smear revealed the presence of Koch blue bodies. The suffering animal was given a single dosage of Buparvaquone, 2.5 mg/kg IM, along with supportive care. The patient recovered successfully after the administration of the treatment stated above. This case study aims to report the successful treatment of theileriosis and limitations of studies of theileriosis have also been discussed.
Keywords: Cattle; Theileria; Theileria annulata; Clinical signs; Diagnosis; Blood smear

1 INTRODUCTION

Theilerioses are tick-borne protozoan illnesses caused by *Theileria spp.* in cattle, sheep, goats, horses, and wild and captive ungulates [1]. Theileria is a genus in the *Apicomplexa* group, which also contains Babesia, Toxoplasma, Neospora, and Plasmodium [2].
Theileria annulata, a protozoan parasite of cattle and domestic buffaloes, is transmitted by ticks of the genus Hyalomma and causes a disease named Mediterranean or tropical theileriosis[3]. Theileria annulata, a protozoan parasite of cattle and domestic buffaloes, is spread by Hyalomma ticks and produces a disease known as Mediterranean or tropical theileriosis [4]. *T. annulata* is extremely pathogenic, causing tropical theileriosis with substantial morbidity and death in cattle [5]. The illness affects an estimated 250 million cattle and has a significant impact on livestock production and improvement in many developing countries [6]. *T. annulata* is more widely dispersed in various parts of the world, from southern Europe to southern Asia [7].
Theileria spp.'s life cycle involves cyclical development in ticks to generate sporozoites; when injected with tick saliva into the mammalian host, sporozoites develop into schizonts in leukocytes and finally piroplasms (merozoites) in erythrocytes. Ruminant illnesses cause fever, lymph proliferative disorders, and leucopenia/anemia to variable degrees [8,9].
Molecular characterization is helping to clarify the nomenclature and classification of Theileria spp., which are found globally, despite ongoing debate. The important pathogens of cattle are restricted to specific geographic regions, after which the diseases are named. East Coast fever (ECF), caused by *Theileria parva*, and tropical theileriosis (or Mediterranean Coast fever), caused by T. annulata, are the two most important theileriosis [10].
Oriental theileriosis (or Japanese theileriosis), caused by *T.orientalis*, is increasingly being linked to illness epidemics in Asia and Australia. The molecular study has identified four *T. orientalis* genotypes (ikeda, chitose, buffeli, and type 5), with the ikeda genotype being the most virulent.1 The disease is spread by Haemophysalis ticks, which live in Europe, the Mediterranean basin, Asia, and Australia. In addition, trans placental (vertical) transfer from pregnant cows to calves has been documented in some regions [11, 12].
Theileriosis is a cause of significant economic loss in domestic ruminants by decreasing milk production, weight loss, and death [13]. Ixodid ticks are vectors in the transmission of this disease and the distribution of the haemoprotozoan parasites broadly coincided with the ixodid tick vector distribution [14, 15].

2 CLINICAL SIGNS

A case was presented at the clinic with the mild depression, normal body condition, normal body coat, normal body posture, and gait. There was lacrimation and serous nasal discharge with a mild cough for one day. Animal body temperature was 105F, heart rate was 92 beats per minute, respiration rate was 32 respirations per minute, conjunctiva was moderately pale, perocular matting, and ears were normal, watery discharge along with mild crusting from nose and prescapular lymph node swollen.

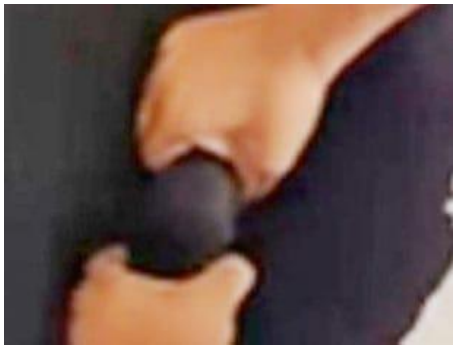

Figure 1 Lymph Node Swollen

Figure 2 White Conjunctiva

2.1 Diagnostic Assessment

Diagnosis of theileriosis in acute cases was mainly based on clinical signs of the infected animals. Blood samples were also sent to a laboratory for confirmatory diagnosis of the disease.

2.2 Laboratory Diagnosis

Thin blood smears were prepared from the blood collected from the ear veins of the animal. Diagnosis of theileriosis was confirmed by microscopic examination of Giemsa stained thin blood. The intracellular presence of *Theleria annulata* was seen under a microscope that lead to a confirmatory diagnosis of theileriosis. The Complete Blood Count Test also revealed a low RBC count, leukopenia, and thrombocytopenia.

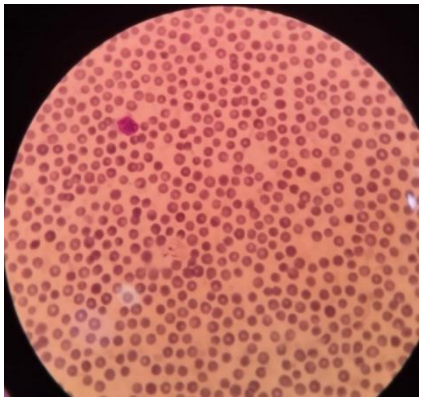

Figure 3 Laboratory Diagnosis of Theileria

3 THERAPEUTIC INTERVENTION

The drug of choice for Theileria is Buparvaquone. For this case, we used long acting antibiotic Oxytetracycline. For fever injection loxin (Flumixin meglumine) was used to reduce pyrexia. Some tonics were used for energy purpose i.e., vitamin B12 was used for their remarkable therapeutic effect. Injection Ivermectin was used subcut to reduce the ectoparasite burden and also for prevention purpose.

4 DISCUSSION

Theileria is a protozoal disease caused by Theileria annulata mainly transmitted from ticks, primarily affecting cattle, sheep, and goats. The disease causes varying degrees of morbidity and mortality. Theileria is one of the major diseases that cause weakness and production loss in dairy animals and also affect body muscle mass. However, theileria remains a poorly understood disease, especially in terms of epidemiological aspects like transmission dynamics across production systems, which are crucial for making effective control policy decisions.

5 CONCLUSION

The case presented was successfully treated and discharged. The owner of the animal was asked for follow up. Buparvaquone was administered by 48hours gap of the first dose with the supportive treatment.

PATIENT CONSENT

Consent was signed by the owner of patient for clinical studies and publications.

COMPETING INTERESTS

The authors have no relevant financial or non-financial interests to disclose.

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