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Co-occurrence of *Theileria orientalis* and *Babesia bigemina* in a dairy cow – A case report

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A B S T R A C T

A 4 year old crossbred Jersey cow with the history of bruxism, swollen prescapular lymph node, high rectal temperature (105.1°F) and moderate tick infestation. Open mouth breathing was significantly noticed. Upon examination of Romanowsky stained blood smear, the erythrocytes revealed presence of piroplasms of both *Theileria orientalis* and *Babesia bigemina*.

Introduction

Haemoparasitic infection in livestock in India is a serious concern for the farmers which causes anemia, debilitating conditions and even immunosuppression and also predisposes infected animal to various opportunistic infection (Nwoha *et al.,* 2013). Haemoprotozoan infections are very common in cattle causing devastating losses to the livestock industry and pose a major threat to the dairy industry throughout the world. Theileriosis and babesiosis are two major haemoprotozoan diseases of crossbred cattle occurring in India transmitted by ixodid ticks. Tick fever or cattle fever (babesiosis) is economically the most important arthropod-borne disease of cattle in India and in vast areas of Australia, Africa, South and Central America and the United States continuously under threat (Bock *et al.,* 2004).

Babesiosis is a tick-transmitted disease caused by protozoan of the genus *Babesia* and it is characterized by haemolytic anemia and fever, with occasional hemoglobinuria and death (Nwoha *et al.,* 2013). It is a disease with a world-wide distribution affecting many species of mammals with a major impact on cattle and man (Bock *et al.,* 2004, Zintl *et al.,* 2003). Bovine babesiosis has a huge economic impact due to loss of milk production of infected animals and death.

Theileria spp. are obligate intracellular protozoan parasites of the order Piroplasmida,

family *Theileriidae*. Theileriosis in cattle is characterized by pyrexia, progressive anemia, swelling of lymph nodes and respiratory distress.

The disease is now reported more frequently and the incidence of theileriosis in India over the last four decades gives a varied range from 3.5-15 % in cattle in field and farm conditions.

Materials and Methods

A dull, anorectic moderately tick infested 4 year old crossbred Jersey cow from Puducherry with bruxism, swollen prescapular lymph node, pyrexia (105.1°F) and open mouth breathing was noticed. The blood smear was prepared from ear vein and stained with Leishman's stain to screen for the presence of blood protozoan parasite.

Results and Discussion

Upon examination of blood smear, the red blood cells were found mostly anaemic few with Rouleax formation. Following vigorous searching the presence of piroplasms of *Theileria* sp. and *Babesia* sp. were recorded. (Picture 1& 2) The parasites were confirmed as *Theileria orientalis* and *Babesia bigemina* as per description of Soulsby (1982).

The most predominant features of *T.orientalis* was rod shaped structure in the erythrocytes piroplasm stage and for *Babesia* pear shaped form was predominant with acute angle in apex of pear shaped form apposing each other.

Blood smear was anaemic in appearance with centrally vaculated RBCs, the animal was dull depressed with reduced milk yield.

Tick borne haemoparasitic diseases have a global distribution, stretching from the polar circle to the equator because of wide host range of ticks and its ability to withheld environmental stress and high fecundity. Haemoparasitic infection especially *Babesia* and *Theileria* may lead to lower milk production or even death in acute phase.

The incidence of mixed infection of haemoprotozoan parasites in cow had been reported worldwide. Mixed infection of *Theileria* and *Babesia* in Puducherry is scanty and finding of this result may be the indicative of multiple disease transmitting ticks present in and around Puducherry since Puducherry open grazing practice is not very uncommon therefore enzootic stability might help to sustain.

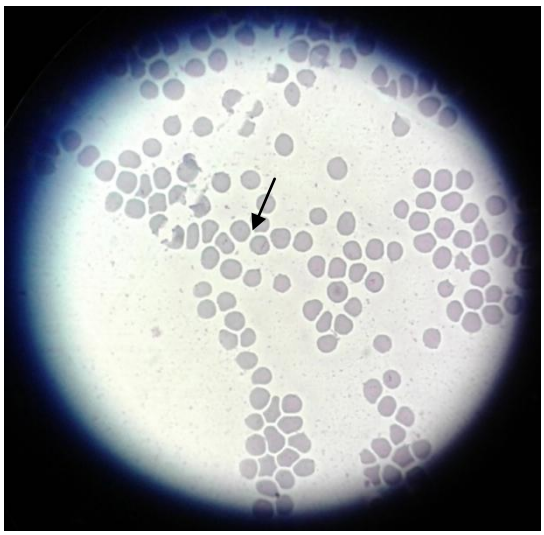
The present blood smear is an additional finding with an open mouth breathing syndrome. The presence of tick infestation reveals the carrier state of cattle population in Puducherry as well as carrier state of two host ticks.

This finding revealed the fact that tick control procedures should be taken into account on priority basis. Conventional microscopic detection methods are still the cheapest and fastest method for identification of blood protozoan parasites in spite of having limited sensitivity and specificity in comparison to immunological and molecular methods.

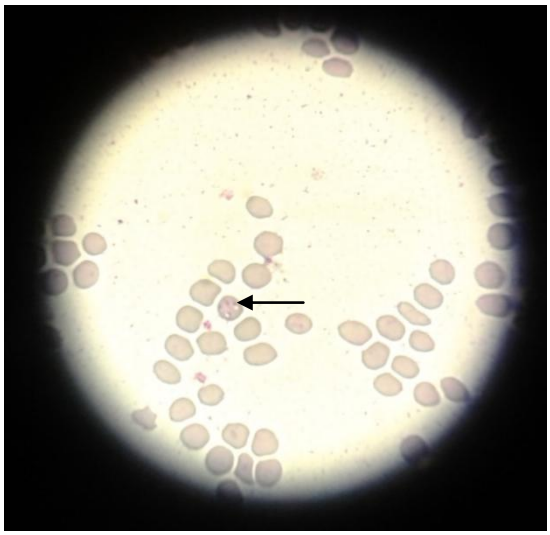
Nowadays added to the production costs, the high cost of tick control, disease detection, prevention and treatment cost etc., has been added (Perez de Leon *et al.*, 2010).

Moreover an indirect and underestimated cost of the disease is related with the refusal of cattle farmers in endemic areas to improve the production of milk in their herds by introducing milk-producing, pure-breed animals, most of them from tick-free areas, because they will present an acute form of the disease and many will die in the following weeks to their arrival.

Picture.1 *Theileria orientalis*



Picture.2 *Babesia bigemina*



The consequence is that the quality of cattle in endemic areas remains low, therefore impeding the development of the cattle industry and the wellbeing of producers and their families (Mosqueda *et al.*, 2004).

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