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## THE DIAGNOSIS, TREATMENT AND CONTROL OF TICK BORN DISEASE - THEILERIOSIS ON A DAIRY FARM

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### **ABSTRACT:**

Bovine theileriosis has been reported in crossbred heifer. On clinical examination the animal showed high rectal temperature, enlarged prescapular lymph node, ruffled hair coat, pale mucous membrane and stiffness of hind limb. A thin blood smear revealed Theileria parasite and the ticks were identified as *Hyaloma anatolicum*. The heifer was successfully treated with buparvaquone, oxytretracyclin, antipyretic and supportive (Dextrose and multi-vitamins). Optimum nutrition and tick control by application of deltamethrin, amitraz and flumethrin found effective for control and prevention.

**KEYWORDS:** Crossbred, bovine theileriosis, diagnosis, buparvaquone, treatment, prevention

**INTRODUCTION:**

The Bovine Theileriosis is a vector born disease caused by protozoan parasite and is characterized by high fever, enlargement of lymph node, weakness, stiffness of limb, emaciation and high death rate in susceptible animals. Young animals are less susceptible than adults. Zebu cattle (*Bos indicus*) are resistant, exotic cattle (*Bos taurus*) are susceptible and crossbreds are at intermediate risk. Indigenous cattle are more resistant due to their inherent ability to limit the explosive multiplication of schizonts during acute phase. The tick transmitted theileriosis pose serious challenges to the exotic and crossbred cattle population. The theileriosis is transmitted by Ixodid ticks of genus *Hyalomma- Rhipicephalus spp.* and *Hyalomma anatolicum* ticks. Hot and humid climate is favorable for tick development and attack. Theileriosis mostly occur during mid to late monsoon season. Different developmental stages of the parasite occur in the tick and they pass trans-stadially through the stages of larva, nymph and adult but there is no transovarian transmission. Mechanical transmission is of no significance. Epidemiology of the disease is thus largely dependent on the vector "tick", including its ability to complete cyclical development, distribution and habitat. Ticks may live for 1-2 years but they lose their infection within 11 months. The risk factor involves hot humid condition favorable for vector OIE (2014). In India Theileriosis is reported from Punjab, Haryana and Gujarat (Mahajan *et al.* 2013, Vohora *et al.* 2012). The annual loss owing to theileriosis in India is calculated approximately 800 million US Dollars (Devendra, 1995). Reasonable prevention of theileriosis is achieved by avoiding nutritional stress and control of tick population (Muhammad *et al.* 2008, Kohli *et al.* 2014).

**CASE HISTORY AND CLINICAL EXAMINATIONS:**

The present animal was reported in an organized dairy farm. A crossbred

heifer was noticed isolated from the herd mate and was off feed. On clinical examination the animal showed high rectal temperature (105.2<sup>0</sup>F), enlarged prescapular lymph node, pale mucous membrane and stiffness of hind limbs. The body weight of heifer was 80 kg. The blood, lymphatic fluid and ticks from housing facility samples were taken for laboratory examination before starting of treatment. The rectal temperature was remained high for almost ten days and on 11<sup>th</sup> day it was normal.

### **LABORATORY EXAMINATION:**

Thin blood smears were prepared after collection of blood from tip of ear, lymph smear were prepared from prescapular lymph fluid and fixed for 5 minutes with methanol. The blood and lymph smear was stained with Giemsa's stain, kept for 40 minutes. Blood and lymph smears were carefully examined under oil immersion for haemoprotozoan. Blood smear examination revealed presence of piroplasm in the RBCs. Lymph smear examination revealed schizonts (Kotch's blue bodies) in the lymphocytes. The laboratory examination identified the ticks as *Hyaloma anatolicum*. On basis of clinical finding and laboratory examination case was diagnosed as Theileriosis.

### **TREATMENT AND DISCUSSION:**

The heifer was treated with Injection Dextose 20% 500ml and Oxyne<sup>a</sup> 20ml (Oxytretracyclin 50 mg/ml) intra-venous and Inj. Vetalg<sup>b</sup> 20 ml intra-muscular on 1<sup>st</sup> day. On 2, 4 and 6 day the heifer was treated with injection Zubion<sup>c</sup> 4 ml (Buparvaquone @ 2.5 mg per kilogram body weight having buparvaquone 50 mg/ml), Vetalg<sup>b</sup> 5 ml and Inj. Tribivet<sup>d</sup> 5 ml (Vitamin B<sub>1</sub> – Thiamine Hydrochloride 50 mg, B<sub>6</sub>- Pyridoxine Hydrochloride 50mg and B<sub>12</sub>- Cyanocobalamin 500mcg per ml)

Intramuscular. As rectal temperature was 104.6<sup>0</sup> F on day 4 the heifer was additionally treated with injection Maxxtol<sup>e</sup> 10 ml intramuscular. On the day 3, 5 and 7 heifer was treated with injection Oxyne<sup>a</sup> 10 ml, Vetalg<sup>b</sup> 10 ml and Inj. Tribivet<sup>d</sup> 7 ml intra-muscular. On 8<sup>th</sup> day heifer was treated with injection Oxyne<sup>a</sup> 15 ml and Vetalg<sup>b</sup> 10 ml intramuscularly and improvement was noticed. The heifer was injected Oxyne<sup>a</sup> 10 ml and Belamyl<sup>f</sup> 10 ml intramuscular and further improvement was noticed on 9<sup>th</sup> day. The heifer was treated with Vetalg<sup>b</sup> 6 ml intramuscular and Bolus Ferritas<sup>g</sup> 1 per oral on 10<sup>th</sup> day. On 11<sup>th</sup> day one bolus Ferritas given orally. On 11<sup>th</sup> day the heifer was released as cured but nutrition was taken care of by individual feeding for one week. Buparvaquone is second generation hydroxynapthaquinone acts by inhibition of mitochondrial electron transport system of the protozoa. Recommended dose rate of Buparvaquone is 2.5 mg per kg body weight and should be repeated after 48-72 hours. The dose of Buparvaquone should be given in neck region at single site not exceeding 10 ml. It is active against the schizont and piroplasm stages of theileria species. Buparvaquone can be used during incubation period of disease or when clinical signs are apparent. The administration of buparvaquone and oxytetracycline showed positive response in treatment of theileriosis and prevention of pneumonic sign due to secondary bacterial infection as reported by the Khanna *et al.* (1983) and Muhammad *et al.* (1999).

#### **PREVENTION AND CONTROL:**

Muhammad *et al.*, (2008) and Kohli *et al.*, (2014) suggested that reasonable prevention of theileriosis can be achieved by avoiding nutritional stress and control of tick population. The optimum nutrition of heifers from affected shed was ensured in terms of dry matter, crude protein and total digestible nutrients (TDN) intake. The period of monitoring reported here was from date report of disease (16.08.2014) to

end of February-2015. The dry matter, crude protein and TDN availability was 106.67, 102.34 and 110.24 per cent, respectively of requirement as per NRC (2001).

The ticks control was achieved by alternate two sprays each of Butox<sup>h</sup> @ two ml per litre of water having Deltamethrin BP (Vet) 1.25 mg/ml and Polmitraz<sup>i</sup> @ two ml per litre of water having Amitraz IP 125 mg/ml carried out at intervals of ten days on animal body except mouth, noses, eyes and ears. The sprayed animals were kept away from place of tying up to four hours. The housing area except mangers and water trough were sprayed with Butox @ three ml and Polmitraz @ three ml per litre water at the same time. Then hosing area was later sprayed alternatively with Butox @ three ml and Polmitraz @ three ml per litre water at intervals of 30 days. Deltamethrin acts by interfering functioning of nervous system and produce hyper excitability by interfering Sodium and Chloride ion channels in brain. It also inhibit adenosine triphosphate (ATP) including Ca<sup>++</sup>-ATPase and Ca<sup>++</sup>/Mg<sup>++</sup>-ATPase and change concentration of several neurotransmitters. Amitraz stimulate  $\alpha_2$ -adrenoceptors causing lethargy and CNS depressant effect. It also inhibits Monoamine oxidase (MAO) that alters metabolism of neurotransmitter amine present in the nervous system (Sandhu and Brar, 2012). After ten days of last spray all calves and heifers of affected shed were applied Flupor<sup>j</sup> (Flumethrin 1 per cent Pour-On solution) evenly along midline of vertebral column from shoulder to tail. Flumethrin belongs to synthetic pyrethroids group of insecticides. The synthetic pyrethroids interfere with the sodium channels of nerve cell membranes, resulting in delayed in depolarization of nerve. The alpha-cyno group pyrethroids like Flumethrin are more potent in this regards causing long lasting chains of repetitive firing in nerve cells. Flumethrin is distributed all over the body surface but does not penetrate the skin in significant amounts. All calves, heifers and cows were regularly observed for ticks and found no tick infestation. The site of sources of infection was identified as calf shed. The cracks in calf shed were

opened. The site was repaired with cement. The site was found free from ticks.

a & j : Product of Zoetis India Ltd.

b : Product of MSD Animal Health

c, d, e & g: Product of Intas Pharmaceuticals Ltd.

f: Product of Sarabhai Animal Health

h: Product of Intervet India Pvt. Ltd.

i: Product of Polchem Hygiene Laboratories Pvt. Ltd.

### **CONCLUSION:**

Bovine theileriosis was effectively treated with buparvaquone. The disease can be prevented by optimum nutrition and effective tick control.

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