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Bovine Theileriosis and Its Therapeutic Management In Crossbred Cows- A Clinical Study In 3 Cases

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ABSTRACT

Three female crossbred cattle aged between 3-5 years were presented to Teaching Veterinary Clinical Complex, BVC, Patna, with history of dullness, anorexia, high body temperature and coughing. Clinical examination revealed anorexia, enlargement of pre-scapular and pre-femoral lymph nodes, pallor mucous, high rectal temperature (104–106 0F) in all affected cattle and suspected for haemoprotozoan diseases. The blood smear examination of all affected cattle revealed theileria infection. Single dose of buparvaquone and oxytetracycline intravenously for 5 days along with supportive treatment has better effect against Theileria annulata in cattle.

KEYWORD

Anemia, Buparvaquone, Oxytetracycline, Nandrolone deaconate, Piroplasms

INTRODUCTION

Haemoprotozoan diseases are causing devastating losses to livestock industry and thus present major constraints to the dairy industry throughout the world (Kohli *et al.*, 2014). Theileriosis in Indian bovines is also a tick borne haemoprotozoal disease mainly caused by *Theileria annulata* and is transmitted through the bites of tick *Hyalomma anatolicum*. The clinical manifestation of Bovine tropical theileriosis varies from per acute to acute to sub-acute to chronic and mainly depends upon the damaging effect of pathogen on the lymphoid tissues and susceptibility to host.

Clinically, the major clinical manifestations are pyrexia 107^{0}F, enlarged superficial lymph nodes accompanied by dullness, anorexia, salivation, lacrimation, nasal discharges (Naik *et al.*, 2010 and Kumar *et al.*, 2016), coughing (Hasanpour *et al.*, 2008), petechiae in conjunctiva, oral and nasal mucosa and unilateral or bilateral exophthalmia (Sudan *et al.*, 2012). In the field, tentative diagnosis of theileriosis mainly depends on clinical signs and tick infestation on the infected animals. However, confirmatory diagnosis is mainly based on blood smear examination (Somu *et al.*, 2017). The haemato-biochemical changes are the indicators for the severity of disease and also considered to be a good tool for the diagnosis, prognosis and to know the therapeutic efficacy (Nazifi *et al.*, 2010).The present study demonstrates clinical manifestation, haemato-biochemical alternations and therapeutic management of bovine theileriosis in cross bred cows.

MATERIALS AND METHODS

Three female crossbred cattle aged between 3-5 years were presented to Teaching Veterinary Clinical Complex, BVC, Patna with a history of dullness, anorexia, high body temperature and coughing since 3-4daysand temperature was not coming to normal level even after the treatment by local veterinarian. Clinical examination revealed anorexia, enlargement of pre-scapular and pre-femoral lymph nodes, pallor mucous, high rectal temperature (104–106 ^{0}F) in all affected cattle (Fig. 1 and 2). The cases were suspected for haemoprotozoan diseases and blood smears were prepared from the marginal ear vein and stained with Giemsa's and referred to IAHP, Patna, for confirmatory diagnosis. Examination of blood smear stained with Giemsa stain showed the presence of *Theileria annulata* piroplasms in large no of RBCs (Fig. 3).About 5 ml of blood was also obtained from each affected animal from the jugular vein and 2ml of blood was transferred to EDTA containing tubes for the estimation of haematological parameters i.e. Hb, PCV, TEC and WBC and remaining 3ml of blood without anticoagulant was used to collect serum for the estimation of biochemical parameters i.e. total protein, albumin, globulin and ALT as per standard protocol (Table-1).

RESULTS AND DISCUSSION

All three affected cattle were diagnosed positive for *Theileria* by blood smear examination. The treatment was initiated with single injection of Buparvaquone (Butalex, Sarabhai Zydus Animal Health Limited) @ 2.5 mg/kg body weight intramuscularly in the neck region and oxytetracycline @10 mg/kg b.wt. intravenously daily for five days. In addition, meloxicam (Melonex, Intas Pharmaceuticals Limited) @0.5 mg/kg body weight intramuscularly for three days and supportive therapy including iron supplementations (aRBCe Rakkt syrup, Vetoquinol India Animal Health Pvt. Ltd. Mumbai) @ 50 ml per day orally and intramuscular injection of Nandrolone decanoate (Motabolin, Relife

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Pharmaceuticals) @ 1 mg/Kg b.wt at weekly interval for three times were also advised to combat anaemia. Topical application of flumethrin 1 % pour-on preparation (Bayticol pour-on, Bayer) over the vertebral column was also advised to remove ticks. The all affected cattle revealed marked clinical improvement and attains towards normalcy after one week of treatment. Further, the examination of blood smears of all cases after treatment revealed no theilerial parasite.

Theileriosis is a haemoprotozoan disease of cattle caused by *T. annulata*, transmitted through Ixodid tick of genus Hyalomma. The clinical manifestations in the present study were in accordance with the findings of Kumar *et al.*, (2015) and Verma and Singh, (2016). Theileriosis causes anaemia in cattle due to the presence of intraerythrocytic piroplasms and erythrophagocytosis (Abd-Ellah and AL-Hosary, 2011 and Ganguly *et al.*, 2015). The mean values for hematological parameters presented in table-1 revealed lower values of Hb, PCV and TEC before initiation of therapy. Similar findings were also obtained by Somu *et al.*, (2017), which is attributed to lysis of erythrocytes by piroplasms which infects and replicate in it and erythrophagocytosis. But, the mean value of WBC was higher in before treatment which was in correlation with findings of Modi *et al.*, (2015) who observed higher values of WBC as compared to control healthy due to proliferation of lymphocytes in the lymphoid organs as a defensive response to invading protozoans, leading to leucocytosis. In present study the mean values of total protein were lower, and this finding was in agreement with Saber *et al.*, (2008), Modi *et al.*, (2015) and Somu *et al.*, (2017), which is possibly due to the harmful effect of toxic metabolites of theileria and due to liver failure, but increased level of ALT and Serum bilirubin values were recorded before initiation of therapy which is much higher than normal serum. These results were in agreement with Modi *et al.*, (2015) and Neamat-Allah, (2016) which might be related to the hepatic dysfunction and the, presumably, haemolytic anaemia (Kumar *et al.*,2016).

In present study there was marked clinical improvement as well as in their haemato-biochemical parameters after treatment. To date remedy for theileriosis is best treated by Buparvaquone which is more effective and reliable drug than any other theilericidal drugs in field condition (Nasir, 2000). In the present study a single injection of Buparvaquone @ 2.5mg/Kg b.wt. intramuscularly and oxytetracycline @10 mg/kg b.wt. daily for five days, intravenously was used as adjunct to buparvaquone because of its antitheilerial activity (Khan *et al.*, 2017) and to cure respiratory infection in cattle. The present recommendations were in agreement with Saravanan *et al.*, (2017). Gharbi and Darghouth, (2015) stated that Buparvaquone @2.5 mg/kg intramuscularly is active against both schizontes and piroplasmes and further recommended the use of long acting oxytetracycline, since it has certain activity against *Theileria* and also prevent frequent secondary infections, mainly respiratory signs. Alirezaei and Nazifi, (2008) recommended the application of long acting oxytetracycline for the treatment of bovine theileriosis. The present study clearly demonstrates that affected cattle were anaemic and thus supportive treatment with iron supplements and nandrolone decanoate was very much useful to facilitate the quick recovery from anaemia. These findings are in agreement with findings of Satheesha *et al.*, (2017) who used iron supplement to combat anaemia and Singh *et al.*, (2013) who suggested that nandrolone decanoate present remarkable improvement of anaemia which might be attributed to the stimulation of endogenous erythropoietin production.

Table 1: Mean values of Haemato-biochemical parameters before and One week after treatment

Parameters	Before treatment	One week after treatment
Hb (gm %)	6.5	8.2
PCV (%)	20	27
TEC($x10^6$ /cmm)	3.42	4.45
TLC ($x10^3$/cmm)	10.2	8.4
Total protein (g/dl)	4.8	5.7
ALT (U/L)	88	65
Serum bilirubin (mg/dl	1.62	0.98

Fig. 1: Showing enlarged pre-scapular lymph nodes

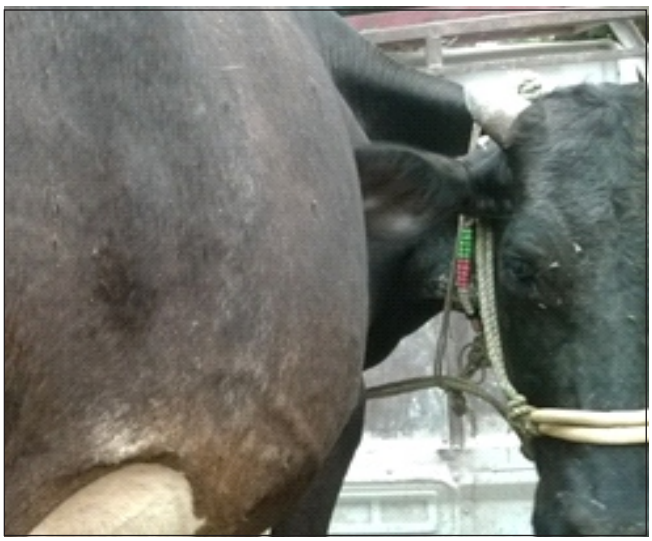

Fig. 2: Showing enlarged femoral lymph nodes and lacrimation

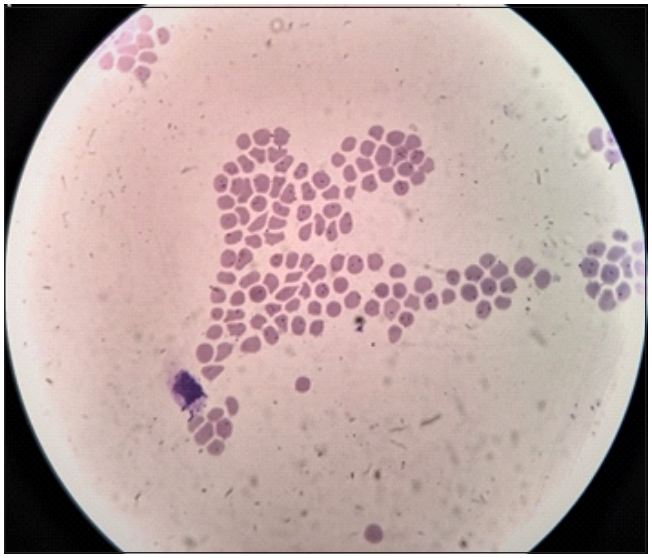

Fig.3. Blood smear showed T. annulata organism in RBCs

CONCLUSION:

In the present study it was concluded that buparvaquone in combination with oxytetracycline and supportive treatment is very much effective for the clinical management of theileriosis in cattle with quick and better recovery.

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