CASE REPORT

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AN OUT-BREAK AND OBSERVATIONS ON TRYPANOSOMIASIS IN FRIESIAN CATTLE AT SABON-BIRNI, KADUNA STATE OF NIGERIA

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ABSTRACT

Bovine trypanosomiasis has clinical features characterized by anorexia, emaciation, anemia and the prognosis is usually guided culminating in death. An out-break of trypanosomiasis was reported and subsequently investigated in Batagarawa farms, Sabon-birni, Rigachukwu LGA Kaduna State of Nigeria. Clinical observations were made on parameters including appearance, temperature, pulse rate, respiratory rate, color of conjunctiva and lachrymal secretions. Record of pre and post treatment indices were also taken.

***Trypanosoma congolense* was isolated from five (5) Friesian cattle out of forty (40) Friesian cattle sampled representing 12.5%. Several workers had reported the occurrence of trypanosomiasis in cattle and goats. The present study deals with the observations on naturally occurring trypanosomiasis in Friesian cattle.**

Haematological examinations were performed employing routing procedures. Biochemical activities and parameters were determined by standard calorimetric method using blood chemistry analyzer. Animals were treated with start doses of Berenil (3.5mg/kg body weight) intramuscularly.

Trypanosomiasis has been recognized as a disease of great economic importance as it generally causes heavy production losses by reduction in milk and other protein yields. There is emaciation in sub-acute and chronic conditions, low working capacity and high mortality in acute cases. This study confirmed that trypanosomiasis is a threat to introduction of exotic breeds of cattle into Nigeria.

INTRODUCTION

Trypanosomiasis is a serious disabling and debilitating tropical disease of man and domestic animal is caused by protozoan flagelate haemoparasite of the genus trypanosoma. It is transmitted by anthropoid tsetse flies (*Glossina spp.*) and is characterized by parasitemia, fever, anemia, loss of normal condition, reduced productivity and frequently high mortality (Ford, 1971; Iwuala *et al,* 1980., Robertson, 1976; and Seigmund *et al,* 1973).

Animal trypanosomiasis constitute a major threat to food security in Nigeria and other part of sub-sahara Africa (Onyiah, 1997, Swallow, 2000 and Abenga *et al,* 2002). Tsetse transmitted trypanosomiasis caused by single-celled parasites, trypanosome, has been recognized as a disease of great economic importance and major cause of livestock death in Nigeria and Africa each year leading to reduction in livestock numbers, reduce calving rates, milk yield, meat supply, work

efficiency of draft animals and mixed farming (Swallow, 2000). Control of the disease has explored the use of drugs, vector control and breeding of trypanotolerant livestock in order to enhance productivity. However, the difficulties associated with these control methods, include drug resistance, re-invasion of the controlled areas by tsetse flies and small population of the trypanotolerant cattle (Enwezor *et al,* 2003). Small ruminants may not often show the clinical signs of this disease. It is assumed that they are rarely affected under natural condition and that trypanosomiasis is not a serious problem (Kalejaiye *et al,* 1995). The occurrence of trypanosomiasis in local breed of cattle (Kumari *et al,* 2000, Rajguru *et al,* 2000), small ruminants (Kalejaiye *et al,* 1995, Mc, Guire *et al,* 1985, and White Law *et al,* 1985) Mcwuena, and Kanyari *et al,* 1986) and also in buffalos (Joshi, and Bhoopsingh, 2001) are well documented. But there is scanty report on the occurrence of trypanosomosis in Exotic breed of cattle in Nigeria, and abroad. The purpose of this study was to investigate the clinical, haematological and biochemical features of naturally occurring trypanosomosis in Friesian cattle.

MATERIALS AND METHODS

The ourbreak occurred in diary herd of 40 grade intensively managed Exotic Friesian breeds of cattle and 240 white fulani of both sexes with ages ranging between two (2) and five (5) years. This herd belonging to Batagarawa farms Sabon-Birni, Rigachikwun Local Government Area, Kaduna State of Nigeria. It covered 40 hectares. The report showed that animals were clinically healthy initially and there had been no recent introduction of cattle into herds, but occasionally neighbors' cattle would stray into the farm. They were housed in pens at night and released into a fenced paddock to graze on improved grass and legume pasture during the day. The feed was supplemented with maize, citrus pulp, brewer's grain and salt lick. The animals were allowed free access to water from nearby natural free flowing stream (river) about 1000 meters to the fenced paddock . The river formed one boundary and cultivated land bordered the rest of the farm. Considerable thicket re-growth had occurred on parts of the farm.

All the animals, 40 Freisian cattle and 240 white Fulani (Bunaji) cattle weighing between 250-350kg body weight belonging to the same farm, but were located at different paddock, 1 km apart. The animals were initially prophylactically treated against trypanosomosis and other haemoparasites on the 15th August 2004 with diminazine aceturate (Berenil® Hoechst, Hamburg, Germany) at 3.5mg/kg body weight intramuscularly. They were also treated against nematode parasite at 4 months intervals with Ivermectin (Ivomec® Merk Sharp and Dome Haavlem, Netherlands) at 0.02mg/kg body weight subcutaneously. Routine disease control measures consisted of once weekly hand spraying of all cattle with 0.3% of toxaphene emulsion to control ticks notably *Boophilus microplus* and *Rhipicephalus evertsi*

All the forty (40) Friesian cattle were sampled on 18th May 2005. About 5 mls of blood was collected from the 40 Friesian cattle via the jugular vein, into the ethylene tetra-acetic acid (EDTA) bottle for routine test before treatment. The samples were subjected to haemotocrit centrifugation techniques (HCT) by Woo (1971) and Buffy Coat Method (BCM) for detection of trypanosomes (Murray *et al,* 1977). The Packed Cell Volume (PCV) was used to assess the anemia while the motility in wet film and morphological

appearance in Giemsa stained film were used to identify the trypanosome species.

All the forty (40) Friesian cattle were given a dose of Berenil (3.5mg/Kg body weight) intramuscularly. Blood was again collected 7-10 days after treatment to assess or ascertained effectiveness of the treatment.

Clinical observations including general appearance, posture, temperature, pulse rate, colour of the conjunctiva and lachrymal secretions were recorded before and after treatment. Haemotological examination were performed employing routine procedure (Schlam *et al*, 1975, Rajkwowa *et al*, 2003). Biochemical parameters were estimated by standard colorimetric method using blood chemistry analyzer (RA-50), Bayer diagnostics, Gujarat, Rajkhowa *et al*, 2003.

Table: Haemato-biochemical profiles (before and after treatment) of Exotic Friesian cattle suffering from typanosomosis *(Mean ∀SE)*

Parameters	Before treatment	After treatment	Normal values (n=30)
Hb (gm%)	9.30∀0.30	12.80**∀0.00	13.51∀0.15
PCV (%)	29.50∀0.50	39.5*∀0.50	40.50∀0.20
TEC x 10^6/Φl	8.80∀0.25	11.91**∀0.15	12.91∀0.15
TLC x 10^3/cumm	4.26∀0.15	1.70**∀0.20	2.30∀0.25
DLC			
Neutrophils (%)	52.80∀0.80	48.05∀0.05	47.02∀0.65
Lymphocytes (%)	45.00∀0.00	49.00∀1.00	50.0∀0.65
Monocytes (%)	2.50∀0.25	2.00∀0.00	1.95∀0.35
Eosinophils (%)	2.50∀1.00	2.00∀0.25	2.05∀0.45
Basophils (%)	0.0∀0.0	0.0∀0.0	0.50∀0.05
Blood glucose (mg%)	30.00∀1.00	36.00**∀.3.00	36.83∀0.17
TSP (gm%)	6.40∀0.15	6.30∀0.05	6.50∀0.05
SGOT (U/L)	102.50∀0.15	161.50**∀1.50	162.15∀3.35
SGPT (U/L)	35.00∀2.00	34.50**∀0.50	36.02∀2.00

DLC = Direct Leucocyte Count. n=number of animals. *p<0.05 ** p<0.01

RESULTS AND DISCUSSION

During a social visit to the farm it was noted that many of the cattle had developed skin lesions and that three (3) females pregnant Friesian cow out of forty (40) Friesian cattle aborted a seven (7) to eight (8) months fetus on the 14th May 2005, while

seven (7) other Friesian cattle were found clinically unhealthy, suspected for trypanosomosis and were examined physically before and after treatment for the presence or absence of Cachexia and other clinical signs suggestive of trypanosomosis (Budd, 1999). Ten (10) of the Friesian cattle had a very prominent ribs and three (3) Friesian cattle are disabling, while seven (7) Friesian were debilitating conditions. Six were found to have elevated rectal temperature, one as high as 41.1°C and were examined thoroughly by standard laboratory procedure. (Rajkhowa *et al* 2003).

Trypanosoma congolense was isolated from five (5) Friesian cattle out of forty (40) Friesian cattle sampled representing 12.5%. Identification of trypanosomes were based on the following criteria: smallest of the size, active motility, the absence of free flagellum, the bluntness of free flagellum, the bluntness of posterior extremity and typical marginal position of the kinetoplast (Richardson and Kendall, 1964). Several workers had reported the incidence or occurrence of trypanosomosis in cattle and goats. (Ugochukwu; 1983, 1986). But considering the source of these Friesian cattle (Cape-town and Europe, (Netherlands)) there is not a single report available on the occurrence of trypanosomosis in this breed of cattle cattle. The present study deals with the observation on naturally occurring trypanosomosis in Friesian cattle. Similar findings were also reported in some breed of cattle suffering from animal trypanosomosis (Kumari *et al* 2000). It is known that trypanosomiasis occurs in all domestic animals in tropical Africa, resulting in acute and chronic manifestation with regular fever, anemia, emaciation and sometimes photophobia. Authors like Kariuki and Jacobson, 1980; Richardson and Kendall, 1964; Smith, Jones and Hunt 1972, are of the opinion that pathogenesis of trypanosomiasis in man and domestic animals is not thoroughly understood. There is a lot of literature on haemotological and biochemical changes in trypanosomal infected animals.

The affected animals showed the symptoms of intermittent fever, dullness, emaciation, anemia palour and mucopurulent discharges from the eyes. All these symptoms disappeared after treatment (7^{th} – 10^{th} days of treatment). There were significant decrease in pulse rate, respiration rate and temperature after initiation of treatment and all these parameters returned to their normal levels by 3^{rd} day post-treatment. Haemato-biochemical changes during trypanosomiasis are in the table I. Marked elevation of the body temperature was the first clinical manifestation following the appearance of the parasites in the peripheral circulation. The fever fluctuated during the course of trypanosomosis treatment irrespective of the level of parasitemia. Ikede *et al* (1977) made similar observation n rabbits infected with *T. brucei/ T. congolense.* Other clinical signs were dullness, emaciation and hyperopnoea – probably related to the fever, anorexia and anaemia respectively. Decreased haemoglobin (Hb), parked cell volume (PCV) and total erythrocytic count (TEC) were noticed in affected Friesian cattle before treatment, which is suggestive or indicative of anemia.

Similar findings were also reported in cattle suffering from trypanosomiasis (Kumari et al 2000). The decrease in Hb, PCV and TEC values in the present studies might be either due to inhibition of erythrocyte formation in the bone marrow or their lysis be endotoxin liberated by *trypanosomes.* The total leucocytic count (TLC) and differential leucocytic count (DLC) revealed leucocytosis associated with lymphopema

neutorphilia and eosinophilia in affected Friesian cattle before treatment. No significant alteration in the percentages of monocytes and basophils were observed (seen or noticed). Present findings are in agreement with the findings Rajguru *et al* (2000) in cattle and naturally occurring trypanosomosis in Mithus (*Bos frontalis*), Rajkhowa *et al* 2003.

Blood glucose showed significant decrease in affected Friesian cattle. The marked hypoglycaemia might be either due to rapid consumption of glucose by trypanosomes (Gill, 1977) or liver dysfunction (Blood and Radostits, 1989). Non-significant variation was observed in the value of total Serum Glutamic Oxaloacetic Transaminase (SGOT) and Serum Glutamic Pyruvic Transaminese (SGPT) level before treatment. These returned to their normal levels by 7th day after initiation of treatment with Berenil®. The increase in the levels of SGOT and SGPT might be due to liver dysfunction as reported by Blood and Radostits (*loc.cit.*). Increase levels of SGOT and SGPT were also reported in buffalo calves infected with trypanosomes evansi (Singh and Gaur, 1983).

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