PREVALENCE OF ANAPLASMOSIS AND BABESIOSIS IN N'DAMA CATTLE OF THE GAMBIA

K. L. KUTTLE1,2, D. J. CLIFFORD2 and B. N. TOURAY2

1Animal Disease Research Unit, Agricultural Research Service, US Department of Agriculture, Washington State University, Pullman, WA, 99164 USA
2International Trypanotolerance Centre, PMB 14, Banjul, The Gambia

SUMMARY

Sera from 184 N'Dama cattle randomly selected and averaging 2-7 years of age were tested for the presence of specific antibodies to Anaplasma marginale, Babesia bovis and B. bigemina, using one or more serological tests including complement fixation, rapid card agglutination and indirect fluorescent antibody (IFA). Tests for A. marginale and B. bovis were essentially negative. Utilising the IFA test 65% of the sera tested were positive for B. bigemina.

Three randomly selected two-year-old N'Dama bulls were splenectomised. All three showed an acute recurrence of a B. bigemina parasitaemia. Two died following typical signs of acute babesiosis and a third recovered following diminazene therapy. No evidence of either B. bovis or A. marginale recrudescence was observed in the single surviving bull. Babesia bigemina appears endemic in the N'Dama cattle of The Gambia but no confirmed serological or clinical evidence of B. bovis or A. marginale was observed.

INTRODUCTION

Bovine trypanosomiasis is known to occur in the N'Dama cattle of The Gambia where their unique tolerance to this disease allows them to survive where most other cattle would die (Clifford and Sanyang, 1979). This apparent resistance offers some hope as a means of cattle production in large areas of Africa infested by tsetse fly. Other than a recent study by Miller, Diall, Craig and Wagner (1984) very little is known about the prevalence of the tickborne diseases caused by Anaplasma marginale, Babesia bovis and Babesia bigemina in N'Dama cattle. Miller et al. (1984) reported serological evidence of B. bovis and B. bigemina in Mali but no clinical cases were reported. This limited study was undertaken to determine if these infections occur in The Gambia and to some extent their prevalence. The work was limited largely to serological studies using antigens prepared from Anaplasma and Babesia parasites of Western Hemisphere origin.

MATERIALS AND METHODS

Anaplasmosis

Sera were obtained from 184 N'Dama cattle averaging 2-7 years of age from the McCarthy Island Division (MID) (80) and Upper River Division (URD) (104) of The Gambia. All sera were tested for the presence of complement fixing A. marginale antibodies utilising the United States Department of Agriculture

3 Present address: Route 5, Box 1259, College Station, Texas 77840, USA.
antigen in a micro-modification of the complement fixation test (CF) (Anon, 1958 and 1974). In addition a rapid card agglutination test (CT)\(^4\) was conducted on 35 sera (13 from MID and 22 from URD) utilising a USDA antigen and procedures previously described (Amerault and Roby, 1968, Amerault, Rose and Roby, 1972).

**Babesiosis (B. bovis)**

Sera from 84 N'Dama cattle (39 from MID and 45 from URD) were tested for the presence of CF antibodies in the presence of *B. bovis* antigen using a micro-modification of procedures previously described (Mahoney, 1962 and 1967). In addition an indirect fluorescent antibody test (IFAT) was conducted on 10 sera (five from URD and five from MID) using antigen slides prepared in the US from *B. bovis* cultures showing a parasitaemia of approximately 15%. Goat antiovine IgG affinity purified sera conjugated with fluorescein isothiocyanate\(^5\) was used at a 1:80 dilution with a 1:160 test sera dilution being used to screen all 10 sera. The techniques used represent modifications of procedures previously described (Johnston, Pearson and Leatch 1973). The IFAT readings were subjective and were made on a comparative basis with known positive and negative sera brought from the US.

**Babesiosis (B. bigemina)**

Sera from 20 N'Dama cattle (seven from MID and 13 from URD) were tested for the presence of specific *B. bigemina* antibodies using IFAT. Antigen slides were prepared in the US from washed erythrocytes of a splenectomised calf acutely infected with *B. bigemina* showing a parasitaemia of approximately 10%. The conjugate was the same as that used in *B. bovis* diagnosis and again a 1:160 test serum dilution was used for all tests. Comparisons were made with known positive and negative sera from the US.

In addition to the serological surveys and before any serological testing three randomly selected two-year-old N'Dama bulls were splenectomised and blood samples monitored for six weeks to identify any possible recrudescing infection.

**RESULTS**

The serological results are presented in Table I. Other than two suspicious reactions among cattle from URD all samples tested were negative to *Anaplasma* CF antigens. The CT conducted on 35 sera confirmed the absence of significant serological evidence of infection. There was one positive serum from URD but its significance was not confirmed by further diagnostic efforts. This positive sample was negative with CF.

Complement fixation tests on 84 sera utilising *B. bovis* antigens did not provide serological evidence of *B. bovis* infection. Positive and negative control sera in both the anaplasmosis and babesiosis CF tests reacted as expected indicating that the test was working properly. A small number of IFAT results confirmed the negative CF data suggesting that *B. bovis* infection is uncommon in The Gambia.

\(^4\) Hynson, Westcott and Dunning, Baltimore, Maryland.

\(^5\) Kirkegaard-Perry Laboratories Inc., Gaithersburg, Maryland.