BOVINE THEILERIOSIS IN BURUNDI:
CHEMOTHERAPY WITH HALOFUGINONE LACTATE

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SUMMARY

In a field trial 100 cattle suffering from naturally acquired East Coast fever caused by Theileria parva were treated with halofuginone lactate at a dose of 0.6 to 2.0 mg/kg body weight. Records were kept of exact diagnosis, treatment and follow up observations. The total recovery rate was 87%. The rate was highest in local breeds (up to 100%) and lowest in Friesian cattle (61.5%). Two treatments were administered to nine animals, two of which had relapsed four to six days after the first treatment. Halofuginone was well tolerated when the therapeutic dose was diluted in at least 500 ml of water. It proved to be a reliable and effective drug in the treatment of theileriosis under field conditions.

INTRODUCTION

Theileriosis caused by protozoan parasites of the *Theileria parva* type is the most important tick-borne disease of cattle in Burundi. It causes heavy economic losses and limits the development of a profitable livestock industry by the upgrading of indigenous breeds. The disease known to be enzootic was first reported by De Greef (1919) but only recent investigations on its epidemiology, pathogenicity and the isolation of strains have identified *T. parva parva* as the prevalent pathogen, the cause of classical East Coast fever (ECF).

A few years ago two effective chemotherapeutic agents became available for the treatment of theileriosis: parvaquone (McHardy and Morgan, 1981) belonging to the naphthoquinone group and the febrifugine derivative halofuginone (Schein and Voigt, 1979). In their study Schein and Voigt treated calves that were artificially infected with *T. parva* and *T. annulata* with 1.2 mg halofuginone/kg body weight given as a single oral dose or as two doses at two to four days intervals. All treated animals recovered. Their results were confirmed by Uilenberg, Jongejan, Perle and Franssen (1980). In further experiments Schein and Voigt (1981) demonstrated that a dose of 0.6 mg halofuginone/kg was too low for effective treatment of *T. parva* infections in three animals. Morgan and McHardy (1982) cured 10 of 11 artificially infected animals treated with halofuginone at a dose of 1.2 mg/kg. Although moderate to severe recrudescence of infection was noted the animals survived. De Vos and Roos (1983) treated eight *T. parva lawrencei* infected and splenectomised cattle with 1.2 mg halofuginone/kg. After a single treatment only one out of five animals survived whereas after two treatments all three animals recovered. Halofuginone was also used by Dolan (1982) and Mwamacki, Irvin and Ong’are (1982) for chemoprophylactic immunisation. They concluded that, due to its unreliable effect during the incubation period, halofuginone is of limited value for that purpose. In a field trial in Tanzania Mkonyi and Njau (1983) treated 51 animals suffering from ECF. The results indicated that effective treatment depends on halofuginone.

3 Clexon, Wellcome/Coopers Animal Health.
administration at an early stage of the disease. These findings were further substantiated by Lutz and Jibbo (1985). The following is a report on the efficacy of halofuginone in the treatment of ECF under field conditions in Burundi.

MATERIALS AND METHODS

During a three-year period from 1981 to 1984 the antitheilerial effect of halofuginone lactate was assayed in a country-wide field experiment involving 624 clinical cases of naturally occurring T. parva infections. For technical reasons it was not possible to follow up on the therapeutic effect of the compound in all cases. The treatment and course of disease was, however, monitored and evaluated in 100 cattle in the present study.

Pure and crossbred Bos taurus and B. indicus cattle aged three weeks to five years from traditional and commercial herds of different areas of the country were affected by ECF. Details of breed types are given in Table I. The body weight of the animals was determined either by means of a balance or by a measuring tape applied around the thorax. It ranged from 20 to 632 kg. The diagnosis of ECF was based on clinical signs together with the demonstration of typical schizonts in lymph node biopsy smears and piroplasms in blood smears. Cattle in all stages of the disease were treated. The onset of the clinical symptoms could not be determined with certainty in all cases. An animal was regarded as clinically infected when the rectal temperature exceeded 39-5°C and T. parva schizonts were detected in lymph node biopsy smears. Hypertrophy of one or both parotid lymph nodes was a common symptom and supported the diagnosis. Following the administration of halofuginone the course of the infection was monitored by daily rectal temperature readings and by microscopic examinations of lymph node biopsy and tail tip blood smears. All smears were fixed in methanol and stained with Gieimsa. Autopsy was carried out on all animals which died. The day of recovery was taken as the day after the last detection of macroschizonts and the return of the rectal temperature to below 39-5°C.

Halofuginone lactate was available in two formulations: tablets containing 50 mg and a solution of 25 mg active substance/ml. The tablets were dissolved in at least 500 ml of water and halofuginone lactate solution was diluted at a minimum ratio of 1:250 in water. The number of tablets and ml concentrated halofuginone solution respectively were chosen at therapeutic levels of between 0-6 and 2-0 mg/kg body weight. The most frequent dose was 1-0 mg halofuginone/kg corresponding to 1-2 mg halofuginone lactate/kg. Treatment was repeated after two to six days in a few cases. The animals were observed for possible side effects resulting from the administration of the compound.

RESULTS

T. parva macroschizonts were detected in peripheral lymph nodes in all 100 cattle at the time of treatment. The infection rate varied from scanty to very numerous, whilst piroplasm parasitaemia ranged from 0 to less than 1% in 79 animals, from 1% to 5% in 17 and greater than 5% in four cattle. Details of the disease response to halofuginone are summarised in Table I. The mean temperature at the time of treatment was, at 40-1°C, lowest in the Ankole and, at 40-7°C, highest in the Friesian group. Ankole cattle were the youngest with a mean age of 3-8 months and had the lowest piroplasm

4 Terit, Hoechst AG.