NOTES ON THE ROUTINE INTRAVENOUS USE OF ISOMETAMIDIIUM IN THE CONTROL OF BOVINE TRYPANOSOMIASIS ON THE KENYA COAST

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SUMMARY

Various chemotherapeutic regimes were used to control trypanosomiasis in 3,000 Boron cattle on an estate on the Kenya coast. Recently the therapeutic use of isometamidium by the intravenous route was adopted to treat individual trypanosome-infected cattle. This was in order to overcome tissue reactions encountered after intramuscular injection and also to control a “thin cow” syndrome attributed to chronic trypanosomiasis. Toxic side effects were eliminated by careful attention to the intravenous technique which was safely used in calves, pregnant cattle and bulls. Weekly blood sampling and treatments of infected individuals resulted in a reduction of cases from 2,187 to 208 out of 46,495 and 46,329 samples examined in 1985 and 1986 respectively. The standard of management was very high and although this routine successfully controlled bovine trypanosomiasis on this estate its application elsewhere is likely to be limited.

INTRODUCTION

Isometamidium chloride⁴ is widely considered to be the drug of choice in the prevention of bovine trypanosomiasis (Morrison, Murray and McIntyre, 1981) and for this purpose isometamidium is administered by deep intramuscular injection. The usual sequel to the correct injection of isometamidium is that an encapsulated lesion forms within the muscle from which the drug is slowly released to give prolonged protection from infection by trypanosomes (Hill and McFadzean, 1963). Under field conditions the carcases of animals which receive repeated injections of isometamidium may be damaged necessitating trimming of affected tissues after slaughter. Attempts have been made to overcome this side effect by complexing isometamidium with the polyanion dextran sulphate (James, 1978; Otaru 1979; Aliu and Sannusi, 1979; Aliu and Chineme, 1980) and also by administering the drug intravenously (Toure, 1973) although caution is necessary (Schillinger, Maloo and Rottcher, 1985). At Vipingo Estate which lies on the Kenya coast to the north of Mombasa cattle are kept primarily for the production of veal (baby beef). Cattle are maintained under trypanosomiasis risk which is controlled by chemotherapy. Several chemotherapeutic regimes have been used to control trypanosomiasis; the most recent regime, the routine use of isometamidium by the intravenous route, is described below.

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CONTROL OF TRYPANOSOMIASIS

MATERIALS AND METHODS

Vipingo Estate lies north of Mombasa on the Kenya coast and comprises a 20 km long tsetse-infested coastal strip and a bush-cleared, cultivated, tsetse-free hinterland. The farm has an intensive form of ranching where cattle are secondary to the sisal plantation. The 3,000 head of Boran cattle were managed as a closed unit in eight herds and bulls ran with breeding herds throughout the year for the purpose of producing veal-type calves for weekly sale. The herd was established in 1973 when 1,000 non-pregnant cows and heifers were introduced from the Eldoret and Kitale areas of Kenya which are tsetse-free. Routine disease control measures consisted of once a week spraying to control ticks; either “Delnav” (Wellcome (Kenya) Ltd) or “Bacdip” (Bayer Ltd) were used; cattle were sprayed in the late afternoon to control ticks and remove tsetse brought in from infested areas and rested overnight in holding pens before being returned to tsetse-infested pastures or the tsetse-free hinterland. Other routine disease control measures included regular vaccinations every three months against foot-and-mouth disease, Rift Valley fever, lumpy skin disease, blackquarter and anthrax.

The presence of *Glossina pallidipes* on the estate resulted in the treatment of cattle from the time of their introduction and a succession of treatment regimes was used. When it was realised that the trypanosomiasis risk was confined to the coastal strip a therapeutic approach to the problem was adopted, individual sick cattle were treated with diminazene aceturate\(^5\). However, this failed to contain the disease and since the herd was increasingly grazed in the tsetse-infested area trypanosomiasis increased and an abortion rate of 10% was reached: there was also an unacceptably high proportion of thin cows and a high trypanosome infection rate in bulls. Control measures changed once more to the use of isometamidium for herd prophylactic treatments as a 4% w/v solution given at 1 mg/kg intramuscularly. To overcome the side effects of tissue reactions at injection sites it was decided in 1984 to use isometamidium intravenously on thin cows on a therapeutic basis.

To avoid problems with perivenous leakage of the irritant isometamidium solution and to reduce acute systemic effects resulting from intravenous administration the technique of intravenous injection was rigorously standardised. Cattle were firmly restrained and 1% w/v solution of isometamidium was given by intrajugular injection at a steady rate at approximately 0.6 mg/kg (i.e. a 350 kg cow received a 20 ml dose). By occluding the vein after completion of injection residual solution was flushed out of the needle prior to its withdrawal. Before adopting the technique routinely detailed records were kept of the first 1,390 animals to receive this treatment from February 1984. The effect of treatment on pregnant animals was also assessed. Following the trial period from February 1985 the intravenous treatment became a routine; the problem of thin cows disappeared and cases of acute haemorrhagic *Trypanosoma vivax* responded well to this treatment. Routine weekly sampling of all cattle which had grazed in the tsetse-infested area was practised. Blood collected from the ear after puncture of a vein with individual sterile lancets was examined as a wet film under home-made polythene cover slips at the crush side. Any parasitaemic animal was then marked and treated immediately.

\(^5\) Berenil ®, Farbwerke Hoechst, W. Germany.