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The course of fatal *Trypanosoma simiae* infection in domestic sheep

Short communication

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The domestic pig is widely believed to be the most susceptible host to *Trypanosoma simiae* infections. When, however, trypanosomes of the sub-genus *Nannomonas* are found in the blood of cattle or sheep and these trypanosomes have proved non-infective to rats, this finding has led to speculation that the organisms may be *T. simiae*. Stephen (1966) indicated that sheep are readily infected with *T. simiae* but that these hosts show considerable variation in their susceptibility to the disease. Desowitz and Watson (1953) reported that the infection in sheep was self-limiting culminating in spontaneous cure in these hosts. Jadin (1940), on the other hand, showed that sheep are resistant to *T. simiae* infections.

The course of cyclically and syringe induced *T. simiae* infections in domestic sheep are described. *Glossina tachinoides* and *Glossina morsitans*, collected from Yankari game reserve, were fed on a domestic sheep for three days. The sheep developed a microscopically patent parasitaemia on day 10 post initial fly challenge. The onset of a patent parasitaemia was marked by dullness and inappetence. Blood evaluation through microscopy showed that parasitaemia remained low throughout most of the observation period. There were, however, occasional periods with 25 trypanosomes per microscopic field in wet blood preparation.

Initially the infection had no overt deleterious effect on the host. Later paleness of the mucous membranes became apparent. By day sixty post infection a notable increase was seen in the parasitaemia. This continued to increase until day 74 when the parasitaemia reached a peak of approximately thirty million organisms per ml of sheep blood.

Giemsa-stained-thin blood films were made from the infected sheep. The morphological characteristics of the trypanosomes were suggestive of *T. simiae*. Six attempts were made at infecting rats, rabbits, guinea pigs and mice with blood from the infected sheep. The trypanosomes were not found infective to

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any of the laboratory animals during observation period of at least 20 days after each inoculation. Concurrent inoculation of infected sheep blood into pigs caused a fulminating parasitaemia within six days and death of pigs within nine days.

Four sheep were infected by syringe inoculation of $10^{7.8}$ organisms from a *T. simiae* infected pig. Two other sheep served as controls.

The prepatent period in sheep, varied from nine to fifteen days. Thereafter a progressive increase in parasitaemia was observed. Low blood glucose level was a common finding at the terminal stage in all infected sheep (25 mg/100 ml). The P.C.V. showed a terminally low value of 12% in all but one of the infected sheep. Three of the infected sheep died on days 19, 22 and 25, respectively.

Treatment of *T. simiae* infection in the remaining sheep with diminazene aceturate (Berenil) at 7 mg/kg cleared the parasite from the blood. The sheep remained aparasitaemic for an observation period that lasted over six months. It is evident that these organisms are pathogenic to these sheep in that all infected animals died if not treated. When compared with the course of infection in pigs the virulence of *T. simiae* was found to be much milder in sheep than in pigs.

The cause of death in *T. simiae* infections, is not precisely known. However, Herbert et al. (1975) showed that they were able to prolong the life of mice infected with *T. brucei* by the administration of glucose, but could not prevent death. This suggests that glucose was not the sole ingredient required from the host by the trypanosomes. The present finding confirms that blood glucose is equally depleted in sheep infected with *T. simiae*. The ability of diminazene aceturate to cure *T. simiae* infection in sheep might be due to an interplay of the bovine immune response and the trypanocide as was previously indicated by Maxie and Losos (1977). Also the effective minimal inhibitory concentration of the trypanocide for *T. simiae* infections in sheep and pigs might be different.

These observations again indicate the potential value of sheep for research into the epizootiology of *T. simiae* infection.

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