RESEARCH NOTE
THE TRANSMISSION OF BABESIA BOVIS USING FROZEN INFECTIVE MATERIAL OBTAINED FROM BOOPHILUS MICROPLUS LARVAE

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ABSTRACT


Boophilus microplus larvae infected with Babesia bovis were removed in a susceptible ox approximately 72 hours after attachment, triturated and stored in a liquid nitrogen refrigerator with dimethyl sulphoxide as cryoprotectant. When inoculated into splenectomized cattle the suspension was infective in the 2 animals into which it was injected intravenously but not in the 3rd, which was only injected subcutaneously. The prepatent period in the infected cattle was 10 and 11 days respectively.

Cryopreservation of erythrocytic stages of several Babesia spp. has become standard practice in some laboratories (Waddell, 1963; Barnett, 1964; Pipano & Senft, 1966; Frerichs, Johnson & Holbrook, 1968; Dalgliesh, 1972a) and injected immediately. Thick and thin bloodsmeared were prepared daily and stained with Giemsa. The animals' rectal temperatures were recorded daily.

Ox 9387 was injected with 2 ml of the suspension, 1 ml intravenously and 1 ml subcutaneously. Typical B. bovis parasites were first seen in thick bloodsmeared taken on Day 11 after inoculation. During the ensuing 5 days the percentage parasitaemia increased rapidly and was accompanied by a febrile reaction. On Day 16 after inoculation chemotherapy was deemed necessary and the reaction terminated following an injection of dimazene*.

To confirm the diagnosis of B. bovis infection a brain biopsy was performed immediately prior to chemotherapy and brain smears prepared as described by Johnston & Callow (1963). Eighty-four per cent of the erythrocytes in the brain capillaries were found to be infected with B. bovis, compared to a parasitaemia of 1% observed in peripheral blood. This predilection for brain capillaries is a distinctive feature of B. argentina infections (Hoyte, 1971; Wright, 1971; Callow & Johnston, 1963) and has also been observed in B. bovis infections at this institute (A. de Vos, unpublished observations, 1973).

Ox 9486 became infected after the intravenous inoculation of 1 ml of the frozen material. The prepatent period in this case was 10 days and again a typical primary reaction followed. On Day 14 the animal had a morning temperature of 40.5°C and a peripheral blood parasitaemia of 0.2%. The reaction in this case terminated following treatment with imidocarb**.

Ox 9499 was inoculated with 1 ml of the suspension subcutaneously. No evidence of infection could be detected in this animal over an observation period of 60 days. To exclude the possibility that it had developed a subpatent infection, an attempt was made to induce a patent relapse by injecting 0.05 mg/kg prednisolone*** intramuscularly for 5 days starting on Day 64 (Callow & Parker, 1969). A brain biopsy was performed on the animal on Day 73, but no parasitized red cells were found during a 30 minute examination of the smears.

Although these results suggest that the inoculum was only infective when injected intravenously, further research will be necessary to confirm and establish the reason for the lack of infectivity following subcutaneous injection.

* Berenil, Hoechst.
** Imizol, Burroughs Wellcome & Co.
*** Delta-Cortril, Pfizer Laboratories Ltd., R.S.A.
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Since the infective particles were the only developmental stage of B. bovis seen in the larvae 72 hours after infestation of the host, it is reasonable to assume that they had survived freezing and were responsible for infection.

REFERENCES


