

AN OUTBREAK OF BABESIA BOVIS INFECTION IN CATTLE AND ITS CONTROL

By :

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SUMMARY

An outbreak of piroplasmosis due to *Babesia bovis* was reported on a State dairy farm. Twenty two cows died from the disease. Most of the infected animals showed severe icterus and haemoglobinuria. Microscopical examination revealed *B. bovis* infection. The sick animals were treated either with N, N-(dimethylquinolyium-methyl sulphate -6-)-urea (quinorium sulphate) or 3,3-bis-(2-imidazolin-2-yl) carbanilide dihydrochloride (imidocarb dihydrochloride). The latter was more effective.

INTRODUCTION

Babesia bovis is a protozoan parasite which invades red blood cells and causes anaemia and haemoglobinuria in cattle. Curasson (1943), Sargent et al (1945) and Donation (1931) have shown that *B. bovis* differs morphologically from *B. bigemina*. Adam et al (1971) reported that the parasite is readily identified by examination of thin blood films stained with Geimsa. Sporadic cases of *B. bovis* infection have been diagnosed previously in Iran, but the disease is rare. This communication reports an outbreak of piroplasmosis due to *B. bovis* in pure-bred imported dairy cows and its control.

MATERIALS AND METHODS

An outbreak of piroplasmosis in adult cattle of Holstein and Red-

Danish breed was encountered for the first time in a State dairy farm at Rasht, in the Caspian region of northern Iran. The herd consisted of 360 adults and 150 calves. Of the 360 adult animals, 260 were put out to pasture. Forty five days later the first signs of the disease were noted. Sixty five cows developed the disease within a period of 10 days. A total of 22 animals died of typical babesiosis. Sick cattle developed pyrexia of approximately 41°C. with yellowish discolouration of visible mucosae. Some presented haemoglobinuria and prescapular lymph-nodes were enlarged in a few cases. Blood smears from sick animals showed parasitaemia of 0.5–3.0%. Smears prepared from liver, spleen and heart of dead animals also showed *B. bovis*. The red blood cells in liver smears reach a parasitaemia of up to 20%. Most of the parasites were annular forms, with some pyriform pairs (1971). They measured about $1.5 \times 2.5 \mu\text{m}$.

Necropsy was performed on four animals. Prescapular lymph-nodes, spleen and liver were moderately enlarged. The tracheal mucosa was oedematous with petechial haemorrhages scattered throughout. The lungs were pale with yellow oedema, and were severely emphysematous. The small intestines showed haemorrhagic enteritis with a few focal haemorrhagic nodules in the jejunum. The rectal mucosa was highly congested. Kidneys were congested and dark red in colour but in two cases they were pale with patchy discolouration of the cortex. The urinary bladder was congested with numerous petechial haemorrhages in the mucosa.

The sinusoids of the liver were distended and filled with red blood cells. Erythrophagocytosis was also seen in liver cells. Brain capillaries were engorged with red blood cells, most of them containing *B. bovis*.

On confirmation of the diagnosis of *B. bovis* infection, all animals and their stable were sprayed with an acaricide (Lindane 25%). Twelve milking cows, the blood smears of which showed more than 1.0% parasitaemia, were selected and injected subcutaneously with imidocarb dihydrochloride (1975) at a dose level of 2 mg/kg of body weight/day for three days. The rest of the animals were treated with quinine sulphate at a dose level of 0.5 mg/kg of bodyweight/day for two days. Two days post treatment with both imidocarb dihydrochloride and quinine sulphate, the blood smears of all animals were negative for *B. bovis*. Twelve days later, smears from two cows which were treated with quinine sulphate demonstrated a relapse and they were retreated with another injection of quinine sulphate (0.5 mg/kg of bodyweight). Their blood smears were negative for *B. bovis* 48 hours later.

Ticks collected from sick animals were identified as *Boophilus annulatus*.

DISCUSSION

The causative organism of this outbreak of piroplasmosis was diagnosed

as *B. bovis*, on morphological grounds. The parasite was located near the margin of the erythrocyte, and was clearly smaller than *B. bigemina* and larger than *Theileria annulata*, the predominant pathogenic protozoan parasites of cattle in Iran. The obtuse angle of the pyriform stages was characteristic of *B. bovis*. The presence of more than 20% infected red blood cells in liver, while in peripheral blood parasitaemia was only about 3%, suggests that the parasite has an affinity for the deep organs, especially liver. Another pathological change characteristic of *B. bovis* infection was the petchial haemorrhages in the urinary bladder mucosa. These lesions are rare in *B. bigemina* infection. *Boophilus annulatus* collected from the animals and their pasture may have had a role in transmission of the disease in this outbreak.

The treatment of animals which heavily infested with *B. bovis*, with imidocarb dihydrochloride at 2 mg/kg for three consecutive days was very effective and entirely eliminated the parasite. None of the cattle relapsed. Following therapy with quinine sulphate, which is the currently used drug in Iran, two animals relapsed. While the results reported here indicate that imidocarb dihydrochloride was very effective in the treatment of *B. bovis* infection, further work is required to confirm these observations.

ACKNOWLEDGEMENTS

The authors wish to thank Dr. M. Kaveh, the General Director and Dr. M. Maghami, the Head of Parasitology Department at the Razi Institute for their encouragement and support.

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