THE EPIDEMIOLOGY, PATHOGENESIS AND DIAGNOSIS OF EPERYTHROZOONOSIS IN SHEEP

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Introduction

Eperythrozoonosis is a sporadic, febrile, haemolytic disease of swine, sheep, cattle and other mammals caused by a rickettsiae. *Eperythrozoon ovis* was first recognised as a blood parasite of sheep by Neitz et al. (1937) in South Africa and has since been reported from a number of other countries. *E. ovis* has been detected in the 1980's and again recently in sheep in Malaysia by Fatimah et al. (1994). The source of infection is however not known. The organism is capable of multiplication in unsplenectomised sheep but its recorded effects are variable. Affected sheep become unthrifty, weak, anaemic, icteric, with loss of production or death. Sheep of all ages and breed are susceptible to infection with *E. ovis*. The objectives of the project were: (a) To determine the prevalence and epidemiology of the infection; (b) to carry out experimental transmission and study the clinical and pathological response of the host; and (c) to develop a less tedious diagnostic technique to identify either the organism or antibodies.

Materials and Methods

Blood were collected in EDTA and plain vacutainers tubes from sheep in several locations in Malaysia. The sheep were clinically examined at sampling. Blood smears were made and stained with Giemsa to examine for the presence of *E. ovis*. The haematological and serum biochemical analysis were carried out using an automated haematology counter (Serono 9120, Biochem Immunosystem, USA) and automated clinical chemistry analyser (Cobas Mira Plus). Thirteen sheep that were naturally infected with *E. ovis* were also monitored for clinical signs, haematological and serum biochemical values, as well as parasitaemia. Spleen and lymph nodes were collected during slaughter for histological and electron microscopic studies. Blood samples from both parasitaemic and non-parasitaemic periods were collected for the scanning and transmission electron microscopic studies.

Results and Discussion

Eperythrozoonosis ovis infection in sheep was found to be localised to certain areas and states during the study. The prevalence rate range from 0-100% and parasitaemia tends to be periodic and the infection grade from mild to severe. The disease is subclinical in new and non-chronic infections. The haematology and clinical biochemistry values are within normal range in new and non-chronic infections. The reticuloendothelial system responses are consistent with those seen in a general infection. *E. ovis* is found on erythrocytes or free in the plasma singly or in pairs, and coccoid or rod-like in shape. *E. ovis* in sheep is non-responsive to oxytetracycline. Histology results showed there was mild to moderate hyperplasia of the follicles, medullary cord and sinuses, with predominantly small lymphocytes and mature lymphocytes in the prescapular an mesenteric lymph nodes. The mesenteric lymph nodes also showed moderate atrophy of the follicles. The histology of spleen showed that there was mild atrophy of the follicles with moderate paracortical hyperplasia. SEM studies showed that *E. ovis* were coccoid and rod-like in shape, diameters of 0.1 to 0.3μm, and sitting on the depressions of the erythrocytes in circulation, spleens and lymph nodes. In lymph nodes, it was frequently observed that one erythrocyte was affected with a few organisms and the affected erythrocytes were attached to macrophages. Phagocytosis of the erythrocytes by macrophages in the area was a significant finding, an evidence of extravascular haemolysis. Not many organisms were observed in the spleen.

Conclusions

The disease seen in sheep and goats in Malaysia is subclinical, the parasitaemia is cyclical and infection rates variable from mild to severe. The haematological as well as clinical biochemical values were within normal range and the reticuloendothelial system response were consistent with those seen in an infection. *E. ovis* microorganisms were found on red blood cells or free in plasma. Affected red blood cells were destroyed by macrophages, through phagocytosis, especially in the lymph nodes.

References

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