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Introduction

Leucocytozoonosis is a protozoal that is characterised by infection of the blood and internal organs. This parasite's life cycle requires two hosts with sporogony occurring in insects and gametogony in a vertebrate host, such as poultry. The insect host is often simuliid flies or culicoid midges and so the disease occurs in areas where these insects occur, for example, southern and south eastern Asia.

Leucocytozoon species

L. simondi – Known to infect almost 30 species of ducks and geese. Present in approximately 20% of wild ducks in the north eastern seaboard area of the USA and 80% of wild geese in Michigan. Affects ducks and geese, but not chickens and turkeys. Vectors – various simuliid flies.

L. smithi – Seen in turkeys in USA, France, Germany, Canada and Crimea. Surveys have shown a wide distribution in USA turkeys. Can be 100% prevalence in US wild turkeys. Not a significant issue for US turkey industry as generally not in same locations as vector flies.

L. caulleryi – Found in chickens in south east Asia and Japan. A survey in the USA showed this parasite to be in 14% of backyard chickens.

L. schoutedeni – Found in 50% of chickens in East Africa.

Epidemiology

Sporogony occurs in the insect host (the vector) and is often completed within four days. Resulting oocytes can remain in the insect host's stomach and produce sporozoites which migrate to the salivary glands where they then infect an avian host the next time the insect bites one. Viable sporozoites can remain in the insect host for up to three weeks after its last blood meal.

Schizogony occurs in the vertebrate host's internal organs. These then produce merozoites and, ultimately, gametocytes which move to the blood and then infect an insect that takes a blood meal and hence the lifecycle is completed.

Pathogenesis

Clinical signs vary a little with parasite species and bird age but typically include listlessness, inappetence, weakness, dyspnoea and, sometimes, death. Pathological effects include anaemia, leucocytosis, splenomegaly and liver degeneration and hypertrophy.

L. smithi infection can be rapid and fatal in young turkeys and muscular incoordination may be seen. *L. smithi* depresses egg production in chickens.

Severe cases of *L. caulleryi* can be characterised by bleeding into the peritoneal cavity and perirenal and subdural haemorrhages.

Diagnosis

This is by the demonstration by microscopy of gametocytes in blood smears of schizonts in tissue sections. There are tests for detecting antibodies to Leucocytozoon infection, for example, ELISA blood tests.

Treatment

This has limited success and no effective treatment is known for *L. simondi* infections. Drugs tried (with varying successes) include pyrimethamine, sulphadimethoxine and halfuginone. Control requires elimination of the insect vector and organophosphate insecticides have been used. Vaccination is a possibility.