

Rabbit coccidiosis (Intestinal and hepatic)

Classification

Eukaryotic, one-celled intestinal parasites

Eimeria stiedae is the agent of hepatic coccidiosis.

Various *Eimeria* species cause intestinal coccidiosis. *E. intestinalis* and *E. flavescens* are considered the most pathogenic, while *E. irresidua*, *E. magna*, and *E. piriformis* are considered moderately pathogenic. *E. media*, *E. perforans*, and *E. neoleporis* are considered the least pathogenic. Other species have been described as well.

Family

Eimeriidae

Affected species

Rabbits. Rodent protozoa are discussed in a separate technical information sheet.

Frequency

Common in wild rabbits. Varying prevalence in pet rabbits. Varying prevalence of intestinal coccidia in commercial rabbitries, but most commercial rabbitries have eliminated *E. stiedae*. SPF rabbits for laboratory use are often free of intestinal coccidia.

Transmission

Transmission is fecal-oral, through ingestion of infectious sporulated oocysts. These may be present in feces in the animal house or in contaminated food or water.

Clinical Signs and Lesions

Older rabbits are generally resistant to infection with coccidia, and the highest morbidity and mortality rates are seen in weanling animals. No sex predilection has been reported. Dose-related responses to coccidia have been seen in experimental infections, with clinical signs only noted with high doses of oocysts, but infection possible with as few as 100. Subclinical infections are possible with all coccidia in rabbits.

In hepatic coccidiosis, affected animals are anorexic, lethargic, and have perianal staining. Diarrhea and abdominal enlargement (due to hepatomegaly) are also seen. At necropsy, animals are thin, and the liver is grossly enlarged with linear, raised, gray-white to yellow lesions in the hepatic parenchyma. The gall bladder and common bile duct are often involved as well. Lesions contain material that ranges from fluid green to dark green to tan. Lesions may be inspissated. Microscopically, the bile ducts are dilated and contain large numbers of *E. stiedae* in acute infections. Affected bile ducts have hyperplastic epithelial changes and in chronic infections, there is significant periportal fibrosis, but organisms may not be seen.

Subclinical infections are common with intestinal coccidiosis. Even the most pathogenic species as described above may elicit no clinical signs. In animals with clinical signs, the most prominent is usually a watery, foul-smelling diarrhoea. Animals may also be thin and dehydrated. On necropsy, the colon and cecum are the most affected portions of the intestinal tract. They may be congested and oedematous, and usually contain more of the watery feces. On microscopic examination, organisms may be seen in the intestinal mucosa. The mucosa itself shows villous atrophy, leukocytic infiltrates, and enterocyte destruction.

Diagnosis

Screening for hepatic or intestinal coccidiosis is generally performed via analysis of feces. Mucosal scrapings, microscopic examination of tissue, and fecal analysis are also used to diagnose infection. In acute *E. stiedae* infection, examination of bile or demonstration of organisms in hepatic lesions may be the best means of diagnosis.

Interference with Research

Animals with *E. stiedae* are not suitable for use in research. These animals generally have clinical disease, serum chemistry analysis on affected animals shows significant metabolic derangement, there is often significant mortality in the colony, and growth rates and feed conversion are affected by *E. stiedae*. In some

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rabbits, there may also be an impairment of the immune response associated with *E. stiedae* infection.

Intestinal coccidiosis may not be a bar to using animals in some types of research. Animals with clinical signs, such as diarrhea, weight loss, and dehydration are obviously not suitable for use. Animals from an enzootically infected colony, where no clinical signs are seen, may be suitable for most research uses. Even in asymptomatic animals or colonies, however, disease may recrudescence if animals are stressed, immunosuppressed, or husbandry conditions change.

Prevention and Treatment

Prevention of coccidial infection in rabbits is generally the best course of action. Incoming animals should be quarantined and tested. In cases where mild, subclinical infections are suspected, collection of large amounts of feces (>1 kg) over several days may serve to increase diagnostic sensitivity. In commercial meat rabbit production, coccidiostatic compounds such as sulfonamides are often added to the diet. Treatment using sulfa compounds is possible, and these treatments prevent disease and reduce shedding, while allowing natural immunity to form.

Concerning infected animals, appropriate measures will depend on their value and the possibility of replacing them. In general, total depopulation, thorough cleaning of all aspects of the animal room (oocysts can survive long periods under moist, cool environmental conditions), and restocking are recommended. Hysterectomy rederivation and embryo transfer have proven successful in eradication of coccidial infections, as have treatment with sulfa compounds, removal of infected rabbits from the colony, and removal of kits from infected does. Staff who work with rabbits must not have rabbits as pets.

References

Baker DG, editor. *Flynn's Parasites of Laboratory Animals*. Ames: Blackwell; 2007. 813 pp.

Fox JG, Anderson LC, Lowe FM, Quimby FW, editors. *Laboratory Animal Medicine*. 2nd ed. San Diego: Academic Press; 2002. 1325 pp.

Percy DH, Barthold SW. *Pathology of Laboratory Rodents and Rabbits*. Ames: Iowa State University Press; 2007. 325 pp.