

Pinworms

(*Syphacia obvelata*, *S. muris*, *Aspiculuris tetraptera*, etc.)

Classification

Metazoan internal parasite

Family

Oxyuridae

Affected Species

The three pinworms listed above are prevalent in rats and mice. In rabbits, the prevalent pinworm is *Passalurus ambiguus*; in gerbils, *Dentostomella translucida*, although infections with *S. obvelata* and *S. muris* have been reported; and in hamsters, *S. criceti* and *S. mesocriceti*, although *S. obvelata* and *S. muris* have been reported. A true pinworm has not been described in the guinea pig, although a cecal worm in the family Heterakoidea, *Paraspidodera uncinata*, has been reported.

Frequency

Pinworms are common in wild and pet animals, with varying prevalence in laboratory animals.

Transmission

Pinworms have a direct life cycle, meaning they do not require passage through an intermediate host to become infective. Pinworms are transmitted through fecal-oral contact (ingestion of embryonated eggs). Eggs of pinworms tend to be sticky and long-lived and so may persist in the environment. Transmission may also occur via fomite. In some cases, the life cycle of a particular parasite may be short enough to allow for reinfection, where eggs cling to the fur, then hatch and crawl back into the animal.

Clinical Signs and Lesions

In immunocompetent animals, infection is generally clinically silent. Some reports have described rectal prolapse, poor hair coat, and weight loss as signs of pinworm infection, but animals in these reports may have had other comorbidities.

Diagnosis

Diagnosis of pinworms may be accomplished by finding ova via the perianal tape test (for *Syphacia* spp. only), anal swabbing, or fecal floatation and/or centrifugation techniques (primarily effective for species other than *Syphacia*), or by examining cecal and colonic contents for the presence of adult animals. Examination of cecal and colonic contents is the most sensitive method when compared to the other diagnostic tools, and is sensitive for all species of pinworm; however, unlike the other techniques, it does necessitate the death of the animal.

Older immunocompetent animals will develop an immunity to the pinworm, mediated by a Th2 response, and may either clear the infection or remain infected with low numbers of parasites. Pinworm detection is best accomplished in newly weaned or subadult animals.

Interference with Research

Since there are rarely clinical signs in most infected animals (even immunodeficient animals), body condition or general health does not generally preclude these animals from use in research. Pinworm infection may have more subtle effects, generally affecting the nature of the immune response, that may render animals unsuitable for use. For example, mice infected with pinworms had a greater incidence of autoimmune disease, nude animals with pinworm infections had an increase in lymphoma prevalence, pinworm infection in one strain of mice was found to affect hemato- and lymphopoiesis, and mice with pinworm infections were found to have an increased allergic response to a dietary antigen. Pinworm infection in a colony may also be considered a marker of inadequate biosecurity techniques.

Prevention and Treatment

Pinworm infections are best prevented by excluding infected animals from facilities. Animals entering the facility should be sourced from reputable vendors. Animals entering from other facilities should be quarantined and tested or treated before release from quarantine.

Treatment regimens for mice and rats are described in the reference literature. For mice and rats, treatment generally involves a week-on, week-off feeding regimen with feed containing fenbendazole. This feed is readily commercially available. Treatment of pinworms in gerbils, rabbits, hamsters, and guinea pigs should be undertaken after a review of the reference literature, as regimens for these animals may be slightly different than those recommended for mice and rats. Although pinworm infection may be treated, treatment regimens may fail and this should be considered when deciding whether or not to treat. Rederivation of a colony will rid the animals of pinworms, but animals may become reinfected if rigorous environmental decontamination is not attempted. Pinworm eggs are resistant to dessication and many common disinfectants, but are susceptible to high temperatures.

References

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