Intestinal Protozoa in Rodents

Classification
Eukaryotic, one-celled intestinal parasites or commensals. Many are flagellated

Family
Various

Affected species
All rodents are susceptible to protozoal infection. Some possible infections are listed below by species, but this is not an exhaustive list. Intestinal (and hepatic) coccidial infections in rabbits are discussed in a separate technical information sheet. Wild-caught animals may have species of protozoa not described here. Some of these protozoa may be zoonotic.

Generally, care should be taken with *Giardia* and *Cryptosporidium* spp. although *Giardia* usually has a limited host-range and transmission to humans from laboratory rodents has not been reported.

The starred species are considered pathogenic (although generally described as “mildly” or “marginally” so):

**Gerbils**: Entamoeba spp., *Giardia* spp.*, Tritrichomonas caviae*

**Guinea pigs**: *Balantidium caviae*, Chilomastix spp., *Cryptosporidium wrairi*, *Eimeria caviae*, *Giardia duodenalis*, *Monocercomonas* spp., *Tritrichomonas caviae*, and others.

**Hamsters**: *Cryptosporidium* spp.*, Giardia muris*, *Spironucleus muris*, numerous others of little significance

**Mice**: *Chilomastix bettencourtii*, *Cryptosporidium muris*, *Cryptosporidium parvum*, *Eimeria* spp.*, Entamoeba muris*, *Giardia muris*, *Hexamastix muris*, *Spironucleus muris*, *Trichomonas muris*, *Tritrichomonas muris*, and others

**Rats**: *Chilomastix bettencourtii*, *Cryptosporidium muris*, *Cryptosporidium parvum*, *Eimeria* spp.*, Entamoeba muris*,

*Giardia simoni*, *Hexamastix muris*, *Monocercomonoides* spp., *Retortamonas* sp., *Spironucleus muris*, *Trichomonas muris*, *Tritrichomonas muris*, and others

Frequency
Rates of protozoal infection vary between individual colonies. Most of the generally pathogenic parasites have been eradicated from modern laboratory mouse, rat, and guinea pig colonies, but may be present in hamster and gerbil colonies. Protozoal infection rates among wild and pet animals are high.

Transmission
Intestinal protozoa are transmitted via contact with infective cysts. This is normally via the fecal-oral route.

Clinical Signs and Lesions
Generally, there are no clinical signs associated with protozoal infection. In immunocompromised animals, or young animals with heavy infestations, non-specific signs such as weight loss, runting, hunched posture, or rough hair coat may be seen. Animals may have signs related to the gastrointestinal tract, such as diarrhea.

On microscopic examination, protozoa may be seen in the stomach, intestinal crypts, or free in the lumen of the gastrointestinal tract. Since infection with commensal protozoa with no sequelae is a common finding, other causes for the non-specific signs mentioned above must be ruled out before a diagnosis of protozoal enteropathy is made.

Diagnosis
Protozoa are generally diagnosed through examination of feces or direct smears of intestinal contents. Some protozoa are present in portions of the gastrointestinal tract best evaluated by histopathology. More detailed information on protozoa, including line drawings and photographs may be found in *Flynn’s Parasites of Laboratory Animals*, edited by D. G. Baker.

Interference with Research
Infection with intestinal protozoa is generally of little
concern, since most pathogenic species have been eliminated from modern laboratory colonies. However, a new infection may be a marker of problems with biosecurity. Animals showing clinical signs are not suitable for use in research, as the disruption of the intestinal tract will have consequences for most research aims. If animals are to be used in protozoal research, as a model of human protozoal infections for example, they should be free of all protozoa. Most research on gastrointestinal physiology or gastrointestinal disease requires animals free of protozoal infection, as well.

Prevention and Treatment
Animals should be screened regularly for protozoa and incoming animals quarantined. Facilities may have a list of protozoa they will accept into their facility in order to minimize the necessity for rederivation for infection with a particular agent. Protozoal infections of any sort are generally not tolerated in immunodeficient animals. Wild animals (vertebrate and invertebrate) should be prevented from entering the animal facility, as these may serve as a reservoir of infection or transmit infective feces via direct contact.

The infective forms of protozoal parasites have varying survival times outside the host and varying susceptibilities to disinfectants. Generally, a thorough cleaning and elimination of all fecal matter in the environment is recommended. As a follow-up, chlorine-based disinfectants or sterilants are often used. Autoclaving will serve to kill infectious forms as well. Treatment of some protozoal infections is possible (for example, metronidazole for Giardia infections) but is not recommended. Treatment will not remove all organisms from an animal, nor will it remove infectious forms from the bedding or cage surfaces. Thus, treatment is only recommended to ameliorate clinical signs or to decrease parasite load before rederivation. Hysterectomy or embryo transfer rederivation is effective in eliminating intestinal protozoa infections.

References