

Common Avian Parasites

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Introduction

Avian parasites commonly seen include protozoa (one-celled animals), helminths (worms) and arthropods (insects and mites). The effects vary from benign to acute death. With companion and aviary bird species, parasitic infections are most common in birds that were recently imported or kept in outside aviaries. Many baby birds sold by pet retailers/brokers throughout the US are bred in warm climates, such as Florida. Because of the warmer temperatures these birds are bred in outside aviaries with plentiful intermediate hosts (certain animals such as insects that can carry/transmit the parasite) and the resultant risk that even domestically raised birds may harbor parasites.

Diagnosis of Parasites

Careful physical examination with the aid of magnification will assist in detecting external parasites. Swabs or scrapings should be taken from any obvious skin or oral lesions. FRESH fecals should always be examined. Direct mounts of feces should be mixed with saline because plain water could cause protozoan parasites to rupture or swell making identification difficult if they are present. Flotations can be performed with routinely used solutions. Flotations are done by mixing feces with a special solution which will cause parasite eggs to float to the surface of the solution which can then be evaluated microscopically. Necropsies may be required with sampling of intestinal contents for parasites and appropriate histopathology (tissues preserved and sent out for microscopic analysis by a pathologist).

Protozoa

Gastrointestinal

Trichomonas

A gastrointestinal parasite which does not require an intermediate host. It is passed by direct contact or through ingestion of contaminated food and water. Parents may pass it to young during feeding. No resistant cyst forms, only motile trophozoites which are 8 - 14 microns in length. They possess undulating membrane (under the microscope it appears to be a wavy membrane as the parasite is moving), move in a jerky manner and body size remains constant during movement. Infection sites include the throat, esophagus, crop, trachea and intestine. Pathogenic (disease-causing) strains cause inflammation and white plaques on gastrointestinal mucosa (lining) or necrosis with accumulation of cheesy material which might block the esophagus and trachea. Causes high mortality and poor growth in young birds, adult birds may become emaciated, display dyspnea (difficult breathing) and vomiting. Pigeons and raptors (falcon) are commonly infected. Seen also in Amazons, cockatiels, budgies, and finches. Diagnosis made through direct smears of affected areas or fresh direct fecal examination. Drugs of choice - Metronidazole (Flagyl), Dimetronidazole.

Giardia

Gastrointestinal parasite that has a motile trophozoite and resistant cyst stage. Direct transmission occurs following ingestion of food contaminated with feces from infected birds. Cysts are stable in the environment and serve as a source of infection. Cysts form as the feces begins to dry and the cyst is very resistant which is the reason for the persistence of the parasite in the environment. Most reports in psittacines involve budgies, cockatiels, lovebirds and gray checked parakeets. Rarely seen in Amazons, conures, cockatoos, macaws and toucans. It has not been reported in finches or canaries. Commonly found in the feces of asymptomatic (not showing any symptoms) adult budgies and cockatiels, suggesting an asymptomatic carrier state with intermittent shedding. Clinical signs include none, loose malodorous stool, mucoid diarrhea, gram negative bacterial enteritis, anorexia, depression, recurrent yeast infections, hypoproteinemia. Poor growth and high mortality can be seen in neonatal budgies and cockatiels. Feather picking has been described as a clinical manifestation, especially in cockatiels. FRESH feces should be examined and mixed with saline, NOT water. Special stains and isolation techniques can also be used. If the feces is older than 10 minutes old the trophozoites (active forms) may not be recognizable as the parasites will begin to form a cyst which can be more difficult to identify. Multiple fresh samples may need to be run due to intermittent shedding of trophs and cysts. Treatment - Metronidazole. Keep aviary clean and dry which reduces the number of cysts and their

viability. Relapses are common after treatment either from endogenous *Giardia* or exposure to environmental reservoirs. *Giardia* has a limited host range and species isolated from birds have not been found to infect other animals. Humans and other animals (including dogs and cats) have their own forms of *Giardia* which does not tend to cross contaminate, however the risk for infection does potentially exist with this parasite so take precautions if your birds or other pets are diagnosed with *Giardia*.

Hexamita

Been described in cockatiels and lorries. Can cause loose stool/weight loss. Similar to *Giardia* but lacks sucking disc and are more truncated (shorter). Swims in a smooth linear fashion. Cysts are infective. Diagnosis and treatment similar to *Giardia*.

Coccidia

Includes a variety of lifestyles and means of transmission. Pass unsporulated (undeveloped) oocysts (like an egg), less than 45 microns in length. The oocysts undergo development in the environment and then become infective. Infection by means of food and water contaminated by feces containing oocysts. Common in mynahs, toucans, pigeons, canaries, finches, and lorries. Infections in mynahs and toucans rarely clinical unless stressed in crowded unsanitary conditions. Clinical disease occasionally seen in canaries and finches. Common form of enteritis in pigeons. Diagnosis through direct fecal or flotation. Treatment - Metronidazole.

Hemoparasites (Blood Parasites)

Haemoproteus

Normally considered non-pathogenic but is a commonly occurring avian blood parasite, especially in imported cockatoos, pigeons and other wild birds. Up to 50% of newly imported cockatoos were found to be positive, while only 5% of long term captive birds were positive. Clinical signs, if they occur, include splenomegaly (enlarged spleen), hepatomegaly (enlarged liver) and pulmonary edema (fluid in lungs). High parasitemia (parasites in blood) can cause clinical problems if the bird is stressed or immunocompromised. Racing pigeons infected may perform poorly in comparison to healthy birds. Diagnosis through peripheral blood smear, identify gametocytes which encircle RBC nucleus. Treatment - not recommended in asymptomatic birds, if affected use quinacrine.

Atoxoplasmosis

Causes disease in canaries and other Passeriforms. Adults are asymptomatic carriers that shed oocysts in feces. Young are susceptible, up to 80% mortality in juvenile birds between 2-9 months of age. Parasite has asexual reproductive cycle (parasite merely divides to produce more) in mononuclear cells (specific type of white blood cells involved in body defense against infection) then spreads through blood to parenchymal organs (such as liver and spleen). Clinical signs are non-specific, depression, anorexia, diarrhea, enlarged liver and dilated gut loops (which may be visualized through skin). Transmission is through ingestion of contaminated feces. Infected birds may intermittently shed. Oocysts are environmentally stable and not killed by most disinfectants. Diagnosis through identification of oocysts in feces, 20 microns, or most often histopathologically. Treatment - none effective. Primaquine to suppress the tissue form, sulfachlor-pyrazine may decrease oocyst shedding.

Sarcocystis

Coccidian parasite that undergoes sexual multiplication in definitive host (opossum), passes oocysts in feces which are picked up by intermediate host, such as bird. The parasite then undergoes asexual reproduction, and spreads through the bloodstream and encysts, often in striated (skeletal) and cardiac muscle. It is restricted to North America and has been associated with acute death in a variety of psittacines. Pathogenicity depends upon the species of bird and infective dose of parasite. Old World psittacines are very susceptible, New World are relatively resistant. Infections are peracute (sudden) and birds often die before sarcocysts (which are visible to the naked eye) develop in the muscle. Psittacine birds in outdoor facilities within the range of opossums are at risk. Cockroaches can serve as a transport host. Fence aviaries to prevent access to opossums. Treatment - Trimethoprim, Sulfadiazine.

Helminths (Worms)

Tapeworms

Can be asymptomatic. May absorb nutrients from host causing bird to be unthrifty and have diarrhea. Most common in finches, African grays (15-20% of imported birds), cockatoos (10-20% of imported birds) and Eclectus parrots. No direct correlation between eosinophilia (increase in eosinophils in blood which are a type of white blood cell which characteristically increases in parasitic infections) and parasitism. Generally infections are non-pathogenic, although large numbers of worms can cause impaction. With severe infection, birds may die following a period of weight loss and diarrhea. Some feel that it may be a cause of feather picking in Old World birds. Tapeworms require

an intermediate host (such as insects or mites which carry the parasite) so infections are uncommon in birds that do not have access to ground. Diagnosis is by identification of proglottids (tapeworm segments) or whole worms in feces. Individual eggs may not be noted in routine fecal samples unless proglottid in feces has ruptured. Treatment - Praziquantel (Droncit).

Flukes

Flukes are rarely reported in imported birds. These are usually Old World species and should be self-limiting because the intermediate hosts of origin (usually an arthropod) are not present in the US. Hepatic (liver) trematodes have been described in cockatoos. They are periodically seen in raptors. Diagnosis through identification of characteristic egg in feces. Treatment - Fenbendazole, Praziquantel, Ivermectin may be used in combination with one of the aforementioned drugs.

Roundworms

Most common parasites found in birds maintained in enclosures with access to ground. Infections are common in budgies and cockatiels. Have a direct life cycle (passed directly from one bird to the next). Eggs require 2-3 week period for embryonated larvae to form in egg and become infective. Viable for long periods in moist warm environments. Resistant to disinfectants, but can be controlled with steam and flaming. Embryonated eggs which are ingested are directly infective. It is theorized that roundworm larvae may encyst in tissue (like dogs/cats) and stress may cause cysts to activate. Periodically test birds that have tested positive for roundworms and periodically worm any outdoor breeding flock. Clinical signs with severe infestation may include, distended abdomen, weight loss, diarrhea, malabsorption, intussusception (telescoping of a portion of the intestinal tract), blockage and death. Diagnosis through fecal examination/flotation. Treatment - Pyrantel pamoate, Fenbendazole.

Baylisascaris procyonis (raccoon roundworm)

Has caused cerebrospinal nematodiasis (roundworms in the brain or spinal cord) from migratory larvae. The egg hatches in the intestinal tract and the larvae goes through an obligatory migration through the body during development before it ends up in the intestine as an adult. It is this migration that is the dangerous aspect of this parasite. Larvae have caused visceral larval migrans (disease condition caused by migrating larvae), enter the CNS, causing considerable damage leading to ataxia (incoordination), depression and death. Been reported in many psittacines and ratites. No diagnostic tests available, usually diagnosed histologically at necropsy. Best means of control is to prevent access of free-ranging raccoons to aviaries. Eggs are thick-walled and long-lived. This parasite is also a risk for humans and other animals.

Capillaria

Tiny thread-like nematodes that affect the GI tract of most species of companion and aviary birds. Most common in macaws, budgies, canaries, pigeons and raptors. Parasite has a direct life cycle. Egg embryonation can take two weeks and eggs remain infective in the environment for months. May cause no disease or weight loss, anorexia, vomiting and anemia. Diagnosis through identification of characteristic bipolar egg on fecal flotation or scraping of suspected lesions. Treatment - Mebendazole, Fenbendazole, Ivermectin.

Syngamus (gapeworms)

Rare in companion birds but seen quite often in wild birds, chickens and ducks. Can visualize the parasite in the trachea (windpipe). Adults are generally resistant, most infections in young birds. Parasite has a direct life cycle. Clinical signs include coughing, open mouth breathing, dyspnea and head shaking. Diagnosis is through clinical signs, visualization of parasite or presence of egg in feces. Treatment - Thiabendazole, Mebendazole, Ivermectin and mechanical removal of worms.

Filarial Worms (Thread-Like Worms)

Have indirect life cycle (meaning that the parasite must be transmitted through another animal, such as dog heartworm disease which is a member of this group of parasites). Are transmitted to birds by blood feeding flies. May see microfilariae (immature larvae) in peripheral blood smears. Commonly were seen in peripheral blood of imported cockatoos (up to 45%) and were often found in conjunction with Haemoproteus. Adults may be in body cavity, chambers of eyes, heart, air sacs or subcutaneous lesions causing masses on the feet/legs. Generally considered non-pathogenic. Worms in joints and subQ lesions can cause severe problems and should be removed. Some have responded to Ivermectin treatment.

Arthropods

Biting Lice

Can cause pruritis (itching) and poor feather condition. Parasites can be observed directly or eggs (nits) attached to feathers. Most species are host specific and die quickly when they leave the host. Dusting with pyrethrins can control infestation.

Mites

Knemidokoptes pilae (Scaly Face/Scaly Leg Mite)

Most frequently diagnosed avian mite on pet birds. Causes prominent disfiguring lesions. Most common in budgies as 'scaly face' and canaries as 'scaly leg' or 'tassel foot', but other birds may be affected. Typically causes proliferation of tissue on beak and face, can also occur on feet/ legs (main site in canaries) , cloaca and wings. As mites burrow they create characteristic honey-combed appearance. Young birds are commonly affected and are believed to obtain mites from parents in nest. Mites normally are present on the skin and cause no disease (like Demodex in dogs) however, genetic predisposition or immunosuppression can lead to mite overgrowth and development of disease. Commonly see Giardia in conjunction. It is not a contagious condition. Diagnosis through characteristic appearance of lesions and skin scrapings of crusts which will contain mites and eggs. Treatment - Ivermectin, orally, topically on skin or intramuscular injections. Repeat in 14 days(with scaly leg may require several treatments at two week intervals). Additional therapy includes shaping beak if disfigured due to condition and topical application of Eurax Cream (human mite treatment) to affected areas.

Sternostoma tracheacolum (Air Sac Mites)

Affects trachea of canaries, finches (especially Lady Gouldians), parakeets and cockatiels. Entire life cycle occurs in respiratory tract of infected host. Eggs spread by coughing or coughed, swallowed and passed in feces. Clinical signs include dyspnea, coughing, sneezing, nasal discharge and open- mouthed breathing. May range from mild to severe with resultant death by asphyxiation. Diagnosis through visualization of small black mites seen upon transillumination of trachea (shining a light through the trachea), presence of eggs in feces, tracheal wash and clinical signs. If a new problem with aviary, question if any new additions were placed in the collection. Treatment - Ivermectin, clean environment to remove eggs that may be present and could cause reinfection.

Dermanyssus (Red Mites)

Feed on blood, may cause anemia, pruritis and poor growth in young birds. Mites emerge to feed at night, spend daytime in crevices throughout cage/perches/toys, etc. Usually seen in recently obtained birds from aviary setting or pet store. Free ranging birds can serve as source of infestation and should not be allowed to nest or roost in aviary. Diagnosis through identification of mite, usually through close inspection of cage and cage contents. Check the slots at the ends of perches and other cracks and crevices in cage or toys. May see parasites in cage at night, especially if white paper towel or cloth is placed on bottom of cage. Treatment - Dust with Pyrethrins. Commercially available mite protectors are generally ineffective on common avian parasites and may cause liver damage.

Feather Mites

Numerous feather mites have been described in birds. Seen in newly acquired or imported birds. They have specific microhabitats including specific portions of the feather. Generally non-pathogenic in host adapted species but can cause clinical problems in non-host adapted species or with heavy infestations when mites move from feathers to skin. Quill mites reside in the pulp of developing feathers and cause damage its growth. Diagnosis through visualization of mites, examination of feather pulp with quill mites. Treatment - Topical pyrethrins, Ivermectin, removal of affected feathers with quill mites.

Conclusion

Hopefully this information will prove useful to you in understanding some of the more commonly seen parasites in pet birds. A successful parasite is one that is able to live in harmony with the animal it lives within and not causing its death. That is why it is so difficult to identify animals that may be suffering from parasitic infections as quite often they show no external signs of disease due to this relationship. However, parasites do weaken animals making them susceptible to other infections and sap them nutritionally which may limit proper development. A significant problem with parasites is that quite often you see no external signs initially. The bird then gets into your collection with the resultant risk of spreading a parasitic (viral or bacterial) infection. That is why it is imperative to deal with quality sources when you obtain your birds. They are more likely to follow a good program of disease prevention and if a problem developed with your bird are more likely to stand behind them. It is also strongly recommended to have any new additions to your collection evaluated by an avian veterinarian. Part of the routine new bird physical examination is blood testing and fecal evaluation. Also it is a good practice to isolate any new birds from your others

for at least thirty days to limit the risk of transmission of a disease the bird may be carrying. Watch for any signs of disease as the new bird, if carrying disease, might sicken in the stress of a new environment with the resultant risk of shedding disease organisms. Wash your hands after handling and wash its utensils separately from those of your other birds. Too often I have seen people place a new bird directly in their collection and then have their new bird sicken with resultant disease in the other birds.

A source for some of the information in this article was the excellent book, *Avian Medicine: Principles and Application* by Ritchie, Harrison, Harrison) a book I highly recommend.