COMMON DISEASES IN PASSERIFORMES

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introduction

The order of Passeriformes (perching or song birds) is the largest order of birds. It includes 5206 species from 63 families, which is more than half of all bird species. The diversity within the order of Passeriformes is great: it includes granivorous, insectivorous, frugivorous, omnivorous and carnivorous species, ranging in size from a few grams (e.g. the pygmy tyrant) to more than 1 kilogram (e.g. the thick-billed raven).

Species most commonly seen in veterinary practice include canaries, finches, waxbills, cardinals and mynahs. Although some people keep them as individual birds in their homes, most times these birds are kept in smaller or larger groups (flocks) in an aviary. Medical problems are therefore often approached from a flock perspective, in which infectious diseases play a central role. These include a variety of viral, bacterial, fungal and parasitic diseases.

The size and nature of most birds limits the possibilities to perform a thorough physical examination and/or additional diagnostic procedures such as blood collection. Careful history taking is essential, combined with a closer inspection of the cage or aviary and collection of faecal samples for a direct wet mount, quick stain (e.g. Gram, Haemacolor) and/or flotation. Necropsy is often essential for identification of the cause of death and/or confirmation of the (suspected) diagnosis. Once a correct diagnosis is made, treatment can be initiated. Most commonly, the only feasible treatment for a flock is administration of medication via drink water and/or soft food. This does, however, have several drawbacks that need to be considered, such as the potential for drug toxicosis during dry, warm weather resulting from increased water intake, or the presence of sub-therapeutic levels in the blood due to reduced water and/or food intake, which may also lead to development of drug resistance.

In the following section a short overview of the most common diseases in Passeriformes will be given.

Viral diseases

Poxvirus outbreaks are particularly common in canaries and finches. The disease is transmitted by bloodsucking insects such as mosquitoes. Three different clinical disease patterns may develop, i.e. the cutaneous, diphtheroid and septicaemic form, with mortality rates varying from 20-100%. A commercially available vaccine that is administered intracutaneously via the wing web method may be used to prevent outbreaks in canaries and crossbreeds.

Of the nine known serotypes of paramyxovirus (PMV), PMV-3 is the most commonly observed serotype in passerine birds. Commonly affected species are Australian and African finches. The disease is generally associated with overall poor condition and neurologic signs (tremor, paralysis, torticollis). Diagnosis can be made using serology or virus isolation. Unfortunately – as is the case for many viral infectious – no specific therapy can be instigated.

Other viruses that may be encountered in passerine birds are polyomavirus, papillomavirus, cytomegalovirus, circovirus and – to a much lesser extent – herpesvirus.

Bacterial diseases

In general, no bacteria can be found in cloacal samples from canaries or finches. Stained cloacal smears may occasionally reveal a few Gram-positive cocci and/or rods. Disease is usually associated with Gram-negative bacteria and is almost always secondary to other primary pathogens, poor management or husbandry-related conditions. Diagnosis can usually be made by culture of the pathogen from faeces or samples collected from internal organs during necropsy. Treatment with antibiotics should preferably be based on the results of culture and sensitivity, which may be administered via the food or drink water.

Of the different bacteria, Escherichia coli and Campylobacter jejuni are the most important bacterial causes for disease in nestlings. In canaries and finches they cause diarrhoea and high mortality. In adult birds, Salmonella typhimurium and Yersinia pseudotuberculosis are often isolated. Both bacteria may either cause peracute death in canaries and finches, or chronic disease. Mycoplasma spp. are often associated with conjunctivitis and other signs of respiratory disease. Isolation of this organism usually proves to be difficult but infections may respond well to treatment with tyllosin, enrofloxacin or tetracyclins. Chlamydiosis – caused by Chlamydophila psittaci – also occurs in Passeriformes, although they are less susceptible to the disease compared to Psittaciformes.
**Fungal diseases**

Although the term “Megabacteriosis” suggests the disease is caused by a bacterium, the infection is caused by a yeast called *Macrorhabdus ornithogaster*, which resides in the wall of the proventriculus. Typical signs include weight loss, chronic depression and undigested seeds in the droppings. Although *Macrorhabdus* is quite easy to identify in a wet mount or Gram stain, it usually proves difficult to find the organism as shedding may be very irregular. Necropsy is often necessary to confirm the suspected diagnosis. Once a diagnosis is made, treatment may be initiated with amphotericin B.

Another yeast that may be found in cloacal samples of passerine birds is *Candida albicans*. It is an opportunistic pathogen that occasionally causes disease in passerines, most commonly tropical finches. Regurgitation, crop stasis, diarrhoea and/or whole seeds in the droppings are classical findings. The typical “budding yeasts” may be found in material collected from the crop or cloaca. Treatment consists of medication with nystatin (not absorbed from the gastrointestinal tract), fluconazole or ketoconazole.

Unlike many other bird species, *aspergillosis* – causing pneumonia and air sacculitis – is not commonly diagnosed in the smaller passerines such as canaries and finches. It is, however, one of the most commonly diagnosed diseases in mynahs causing signs such as loss of voice and – dependent on the location – puracue or chronic dyspnoea. Diagnosis and treatment are similar to psittacines.

Dermatomyces are occasionally reported in passerine birds. The causative agents are usually *Microsporon gallinae* or *Trichophyton spp*. Infections are generally characterized by feather loss and hyperkeratosis, which is predominantly located at the head and neck. Treatment with enilconazole sprays or topical miconazole ointment is usually effective.

**Parasitic diseases**

Both endoparasitic and ectoparasitic diseases are regularly encountered in the smaller passerines.

**Ectoparasitic diseases**

Ectoparasites include biting and chewing lice and mites. Blood-sucking mites, also known as red mites or *Dermanyssus gallinae*, only feed on their host for short periods of time, giving rise to pruritis, anaemia and mortality, particularly among the nestlings. The mites usually reside in nests and other dark places in the aviary, where they – or their excrement – can be found. Lightly dusting with permethrin powder or spray may be effective. Fipronil may also be used. Preventative measures should be implemented prior to the breeding season in aviaries with a known history of red mites. These may include the use of an insecticide or predatory mites (Dutchy’s). Other commonly found mites in passerines are *Kne- modikoptes spp.* and a variety of feather and quill mites. The latter species usually cause general restlessness and feather damage (e.g., horizontal stress bars, haemorrhage in the shaft), whereas *Knemodikoptes pilae* (scaly mite) tends to cause hyperkeratotic lesions, particularly on the feet. Kneomodikoptic mange may be effectively treated by use of ivermectin as a “spot-on” treatment (Bogena antiluchtpijpmitz). This treatment may also be used when birds are infected with *Stenome- toma tracheacolum*, the tracheal mite that causes clinical signs such as gasping, wheezing, loss of voice and clicking sounds.

N.B. Ivermectin should be used with caution in finches, as it is toxic in some species such a zebra finches and bull finches!

**Endoparasitic diseases**

The most common disease in passerines involving flagellates is cochlosomosis. *Cochlosoma spp.* are flagellates that inhabit the gastrointestinal tract of some finches. Society finches may be inapparent carriers of this organism. When they are used as foster parents – particularly for Australian finches such as Gouldian finches – they may transfer it to the young birds. This may cause clinical signs such as diarrhoea, undigested seeds in the faeces, dehydration and high rates of mortality. The motile flagellates may be identified in direct wet preparation of fresh warm faecal samples. It is advised to screen and treat all breeding finches – particularly foster parents – prior to breeding. Ronidazole may be used for this purpose. Other flagellates, such as *Trichomonas spp.* and *Giardia spp.*, may be treated in a similar fashion.

Coccidial infections are caused by *Eimeria spp*. *Isospora canaria* is common in canaries and causes diarrhoea and emaciation. This organism is, however, considered less pathogenic than *Isospora serini*, the causative agent of atoxoplasmosis. Whereas *Isospora canaria* completes its life cycle within the intestinal tract, *Isospora* (or *Atoxoplasma*) *serini* penetrates the intestinal wall and spreads in lymphocytes and macrophages to parenchymal organs such as the spleen and liver. The disease, which gives rise to clinical signs such as debilitation, anorexia, diarrhoea, respiratory distress, hepatomegaly and sometimes neurologic signs, is commonly encountered in flocks of canaries, and – less frequently – in tropical finches or mynahs. Unlike *Isospora canaria*, which may be readily diagnosed upon finding the oocysts during wet mount or flotation of faecal samples, *Atoxoplasma* is more difficult to diag-
nose ante mortem. This is because after the acute phase, few oocysts are excreted. Necropsy is almost always necessary to confirm the diagnosis. A variety of anticoccidial drugs (e.g. toltrazuril, sulfachloropyridazine or other sulfonamides) may be given, but often do not eliminate the infection as _Atoxoplasma_ is considered extremely resistant.

Various types of helminths may inhabit the gastrointestinal tract of passerine birds, including nematodes (e.g. _Spiruridae_, _Ascaridia spp_, _Capillaria spp._) and cestodes (mainly in insectivorous finches, e.g. parrot finches). Often times they are present in apparently healthy animals, but may cause disease when present in large numbers. In these instances clinical signs such as weight loss, diarrhoea and general debilitation may be apparent. Treatment depends on the type of worm that is identified. Ivermectin, levamizole and fenbendazole may be effective for treating most roundworm infections, whereas praziquantel is the drug of choice to treat tapeworm infections. _Syngamus trachea_, or gapeworm, lives within the lumen of the trachea and may lead to onset of clinical signs such as respiratory distress, gasping or head shaking. The disease is particularly common in larger passerines, such as starlings and crows, and may be diagnosed either by direct visualisation of the worms in the trachea (tracheoscopy) or identification of the eggs in a faecal flotation. Treatment is similar to other roundworms.

Non-infectious diseases
disease may also occur as a result of non-infectious causes, which – dependent on the aetiology – usually affects the individual bird. Canaries and finches in particular are highly susceptible to _toxic inhalants_ and _trauma_. As they panic easily, they may fly into a wall or window which may subsequently result into head injuries, fractured wings and/or legs, or ruptured air sacs. In mynahs, iron storage disease (_hemochromatosis_) is one of the most frequently occurring diseases. Dietary imbalances (e.g. high dietary iron content, excessive ascorbic acid and/or lack of tannins) may result in absorption of excessive amounts of iron, which is stored in the liver, eventually leading to liver failure. Diagnosis can be made by histopathologic examination of a liver biopsy or quantification of hepatic iron concentration. To alleviate clinical symptoms, supportive care should be initiated. Phlebotomy and/or administration of deferoxamine can reduce liver iron concentration. Feeding low-iron diets and/or addition of tannin-rich tea to the drink water may prevent the disease. Passeriformes do not seem prone to developing tumours. Feather cysts, however, are common in heavily feathered canaries (Norwich, Gloucester) and appear to be hereditary.

**Prevention**

In many cases the occurrence of disease is secondary to poor management. It is therefore important to address these issues and not merely focus the attention on treatment of the pathogen. Optimizing husbandry, nutrition and hygiene (including vermin control), together with regular check-ups by a veterinarian, will be crucial for effective elimination of a disease. When a disease outbreak occurs in a flock it is advised to (temporarily) stop breeding to prevent further spread of the disease among the breeding birds (stress) and their nestlings, which are particularly prone to developing disease. Additionally, all contact with other birds should be avoided. Particularly when visiting shows, exhibitions, bird markets or other breeders, during which a lot of contact with unknown birds in a small space takes place, the risk of obtaining a transmissible (infectious) disease is greatest. The use of a quarantine facility, in which newly purchased birds can be isolated from the rest of the flock and monitored for signs of disease, is highly recommended.

**References**

Available upon request.