Prevalence of Selected Avian Disease Conditions

Robert E Schmidt DVM, PhD and Drury R Reavill DVM

In order to assess the prevalence of selected diseases/lesions seen in birds, we studied accessions in the data base of the Zoo/Exotic Pathology Service from October, 1984-July, 2001. This paper discusses some of the results and comparisons.

Results

The total number of accessions was 17,899. Of these, 13,301 were avians. For the purposes of this paper we have divided the results into psittacine and non-psittacine birds, etiologic diagnoses, morphologic diagnoses, organs affected, and some comparisons between the occurrence of disease conditions in psittacine and non-psittacine birds.

The ten most frequently examined psittacine birds are listed in table I, and table II lists the ten most frequent non-psittacine birds. The numbers for the psittacine birds are relatively greater as there are more species represented in the non-psittacine category.

Etiologic categories are generally divided into infectious and noninfectious conditions. Infectious disease prevalence [as a % of avian accessions] is given in table III, and noninfectious in table IV. The largest category was "undetermined", at 41.17%.

The prevalence of tissue submitted by organ system is given in table V. The five most common organs examined were skin, liver, lung, kidney and ventriculus.

The most frequently morphologic diagnoses are listed in table VI. Renal disease is comprised of nephritis of all types, and nephrosis. Hepatic disease includes conditions such as hepatitis, cholangiohepatitis, necrosis, vacuolar hepatopathy, and chronic-active hepatitis ["cirrhosis"].

Neoplasia is both a morphologic diagnosis and an etiologic category. Table VII lists the organs most frequently seen with neoplastic disease as a percent of avian accessions.

Tables VIII and IX show comparisons of the prevalence of the five most common infectious and noninfectious conditions in the five most commonly submitted psittacine and nonpsittacine birds. The percentages were calculated using the total submissions for each species rather than the total of avian accessions.

Discussion

The data presented represents material sent to one diagnostic pathology practice in the United States [US]. Although we cannot be completely sure, we feel that the prevalence of species and conditions is probably representative of the pet/zoologic bird populations in the US. The pet bird data may also reflect things such as owners perception of value, both economic and emotional, as well as many factors that cannot be quantified.

The number of psittacine bird accessions is most likely a reflection of the number presented to veterinarians, and may indicate the relative popularity of these species in the US. The numbers of the most common non-psittacine birds are not as great as the psittacines, but there are many more species in this general category. The number of ostriches reflects a situation that no longer exists, and in a few years they will probably not be one of the ten most frequent non-psittacine submissions.

Viral disease is the most prevalent infectious condition, due to the number of conditions affecting psittacine and small passerine birds. These diseases often occur in outbreak form with potentially devastating results in aviaries, which may account for the prevalence of accessions. Other infectious diseases are often more slowly developing giving time for therapy, while viral diseases are of rapid onset and in most cases have no specific treatment.

Assigning a cause to noninfectious disease conditions is more difficult, as in many cases the lesions are not definitive. If there was significant doubt, the cause was listed as undetermined. The categories represented are considered to have definitive lesions in most cases, but there is overlap in the case of nutritional/metabolic and toxic, and classification was often aided by history or other laboratory findings.

Not surprisingly, the skin and subcutis represents the largest number of submissions in the organ system category. In the early days of the practice, there was less biopsy material from internal organs, and fewer animals being necropsied. The large number of disease conditions that can affect the avian liver are reflected in the prevalence of liver samples examined. The whole body category indicates disease conditions that affected three or more organs.

Despite the larger number of skin submissions, the most frequent morphologic diagnosis is hepatic disease. In part this is because skin biopsies are done in cases of feather picking that are due to internal disease or behavioral problems, and no morphologic change is found. The sixth most frequent morphologic diagnosis, ganglioneuritis, is an indicator of the prevalence of Proventricular Dilatation Disease in the US.

Neoplasia is seen most frequently in the skin. In part this is due to the ease of obtaining samples. The prevalence of cloacal neoplasia is primarily due to the frequency of cloacal papillomas in certain psittacine birds.

In psittacine birds there are definite differences in the prevalence of certain diseases. Cockatoos and African grey parrots have a higher rate of viral infection, primarily due to

circovirus. Mycobacterial infections are most common in amazon parrots, but a similar prevalence is seen in finches and pigeons. For comparison, the prevalence of mycobacterial infection in *Brotogeris* sp. is 12.28 percent. Cockatiels and amazon parrots have the highest prevalence of neoplastic disease. Cockatiels have more nutritional/metabolic problems with renal disease being the primary lesion seen. African grey parrots are more often diagnosed with probable allergic skin disease than other psittacine birds.

For non-psittacine birds viral infections are much more common in canaries and pigeons. Neoplasia is also more common in canaries. The largest percent of nutritional/metabolic conditions is seen in toucans associated with the common iron metabolic problems that are fatal in many of these birds.

Although not without its limitations, the material presented gives a representative idea of avian disease prevalence in the US. Although beyond the scope of this paper we could also determine if there are any specific geographic differences in the prevalence of species submissions or the occurrence of avian diseases in the US.

Table I
Psittacine Birds

Species	Total Number
Cockatoo	1769
Cockatiel	1468
Macaw	1427
Amazon Parrot	1163
African Grey Parrot	1037
Conure	659
Budgerigar	544
Parakeet [not specified]	433
Eclectus	345
Lorikeet	188

Table II
Nonpsittacine Birds

Species	Total Number
Canary	288
Finch	275
Dove	215
Pigeon	192
Duck	112
Ostrich	89
Toucan	69
Goose	62
Flamingo	51
Mynah	40

Table III
Prevalence of Infectious Etiologies

Etiologic Category	Percent of Total
Virus	8.20
Bacteria	4.63
Chlamydia	1.44
Mycobacteria	0.51
Megabacteria	0.07
Fungus	1.56
Nematode	0.20
Cestode	0.05
Trematode	0.07
Protozoa	0.85
Arthropod	0.05

Table IV
Prevalence of Noninfectious Disease

Category	Percent of Total
Nutritional/Metabolic	7.65
Neoplastic	6.95
Physical	1.98
Allergy	1.02
Toxic	0.72
Endocrine	0.38
Congenital	0.15

Table V
Prevalence of Organ Systems Submitted

Organ System	Percent of Total
Skin/Subcutis	31.53
Liver	22.37
Gastrointestinal	12.02
Respiratory	8.04
Lymphatic	6.35
Whole Body	6.25
Urinary	4.78
Nervous	1.60
Peritoneum/Mesentery	1.49
Musculoskeletal	1.26
Endocrine	1.23
Reproductive	0.62
Special Sense	0.57
Hematopoietic	0.10

Table VI
Most Frequent Morphologic Diagnoses

Diagnosis	Percent of Total
Hepatic Disease-all types	12.60
Dermatitis	11.62
Feather Necrosis	5.77
Pneumonia	4.24
Renal Disease-all types	2.81
Ganglioneuritis	2.81
Enteritis	2.33
Splenic Disease-all types	1.91
Ventriculitis	1.16
Myocarditis	0.88
Proventriculitis	0.80
Meningitis/Encephalitis	0.50

Table VII
Organs Most Frequently Affected by Neoplastic Disease

Organ	Percent of Total
Skin	1.73
Cloaca	1.10
Liver	0.62
Ventriculus	0.24
Proventriculus	0.23
Bone	0.21
Lung	0.17
Ovary	0.15
Oviduct and Kidney	0.12

Table VIII
% Occurrence of 5 Most Common Etiologic Categories in Psittacine Birds

	Cockatoo	Cockatiel	Macaw	Amazon Parrot	Af. Grey
Etiology					
Virus	31.28	5.39	15.00	9.67	20.78
Bacteria	9.29	6.55	7.22	10.93	10.59
Fungus	2.0	2.04	2.78	3.80	6.27
Chlamydia	0.73	5.09	1.81	8.08	1.16
Mycobacteria	0.09	0.58	0.28	2.69	0.19
Neoplastic	2.11	12.37	7.36	11.73	2.16
Nut/Metab	5.24	8.73	3.75	5.55	5.29
Physical	0.74	3.35	2.22	2.06	0.98
Toxic	0.09	1.16	0.69	0.00	0.59
Allergy	0.83	0.58	1.39	1.27	2.55

Table IX
% Occurrence of 5 Most Common Etiologic Categories in Nonpsittacine Birds

	Canary	Finch	Ostrich	Pigeon	Toucan
Etiology					
Virus	24.83	7.89	0.00	16.18	0.00
Bacteria	6.71	15.79	22.62	17.65	6.82
Fungus	6.04	4.38	1.19	1.47	4.55
Chlamydia	0.67	0.08	0.00	2.94	0.00
Mycobacteria	0.00	2.63	1.19	2.94	2.27
Neoplasia	6.71	2.63	1.10	2.94	0.00
Nut/metab	6.04	12.28	15.48	2.94	56.82
Physical	0.67	2.63	1.10	1.47	0.00
Toxic	0.00	0.00	1.10	0.00	4.55
Allergy	0.67	0.00	0.00	1.47	0.00