Evidence-Based Advances in Avian Medicine

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KEYWORDS

• Avian • Diagnosis • Cardiology • Prognosis • Atherosclerosis • Avian bornavirus • Reproductive disorders • Pharmacokinetics studies

KEY POINTS

- Fecal Gram stains should be use as a parallel testing strategy with fecal culture, because many of the bacteria identified in cytology might ultimately not be isolated in culture.
- For the assessment of the fractures of the pectoral girdle, addition of a caudoventral-craniodorsal oblique radiographic view made at 45° to the frontal plane improves sensitivity and specificity of ventrodorsal radiographs.
- Rocuronium bromide topically results in safe and reliable mydriasis in the multiple species of birds evaluated, which might be advantageous for evaluation of the posterior chamber during ophthalmic examination.
- Avian bornavirus can be transmitted vertically, whereas horizontal transmission by direct contact appears to be an inefficient route of infection in immunocompetent fully fledged domestic canaries and cockatiels in experimental conditions.
- Deslorelin acetate implants successfully prevent egg laying in cockatiels, pigeons, and Japanese quails with variable efficacy and duration between species and without apparent adverse effects.

INTRODUCTION

This article presents relevant advances in avian medicine and surgery over the past 5 years. New information has been published to improve clinical diagnosis in avian diseases, especially in diagnostic imaging, cardiovascular medicine, and ophthalmology. This article also describes new pharmacokinetic studies on antimicrobial, antifungal,

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cardiac, anticonvulsant, and psychotropic drugs, with a direct application on therapeutic management of a large number of disorders and diseases. Advances in the understanding and treatment of common avian disorders, including proventricular dilation disease, atherosclerosis, and reproductive disorders, are presented in this article as well. This article does not cover advances in avian pain management and anesthesia, despite being one of the most remarkable areas in which avian medicine has progressed, because they are covered elsewhere in this issue. Although important progress has been made over the past years, there is still much research that needs to be done regarding the etiology, pathophysiology, diagnosis, and treatment of avian diseases to support an evidence-based approach (**Table 1**).

EVIDENCE-BASED ADVANCES IN DIAGNOSIS

Laboratory Testing

The normal gastrointestinal flora of healthy psittacine birds is composed predominately of gram-positive bacteria. Pathogenic bacteria are usually gram-negative, and normal percentage of gram-negative is usually controversial among clinicians. In a recent study in healthy Hispaniolan Amazon parrots fed 100% pelleted diet, fecal Gram stains from cloacal swabs showed 97% of gram-positive bacteria with 86.2% of gram-positive rods, and 14.7% of gram-positive cocci.[1] Although 70% of the birds had 100% of gram-positive bacteria, 30% of the parrots had from 3% to 15% of gram-negative bacteria on Gram stains. *Escherichia coli* was the only gram-negative bacteria identified on cloacal swab culture. Overall, agreement between Gram stain and culture was fair, with a tendency for culture to underestimate the true diversity of bacterial flora. This study highlights that gram-negative bacteria are not uncommon in healthy Hispaniolan Amazon parrots and that Gram stains may be of higher value than culture as screening tests for health assessment. Culture should be performed with abnormal Gram stains and/or digestive clinical signs.

Liver enzymes and bile acids are commonly used to evaluate the liver in birds. To determine the threshold for detecting acute liver injury by plasma biochemical testing, liver enzymes were measured in fasted Indian ring-necked parakeets (*Psittacula krameri manillensis*) after experimental induction of liver injury through hepatic biopsy or crush injury.[2] Plasma sorbitol dehydrogenase (SDH) activity was the most specific indicator of liver injury in this species, increased above 12 U/L at 12 hours, and returned to normal values after. Bile acid concentrations and c-glutamyl transferase activity were not affected. Increases in serum aminotransferase, lactate dehydrogenase, and alkaline phosphatase in the first 24 hours were assumed to be related to muscle injury as the creatinine kinase was elevated. Further studies are needed to evaluate the use of SDH in liver injury diagnosis in other avian species.

Acute phase proteins (APP), such as serum amyloid A (SAA), are used to assess acute and chronic inflammation.[3–6] APPs are classified as negative and positive, and major, moderate, and minor.[3–6] Positive APPs increase and decrease shortly after an inflammatory event but continued inflammatory stimulus results in persistent and progressive increases.[3–6] A significant increase in SAA was observed in falcons with inflammatory diseases compared with healthy birds or birds with noninflammatory disease.[3] Surprisingly, SAA activity was not associated with amyloidosis in these falcons, possibly because liver failure had already compromised the production of SAA. SAA levels remained significantly increased in falcons with chronic pododermatitis or fungal pneumonia/airsacculitis. In another study, falcons with confirmed aspergillosis showed significantly lower prealbumin values.[4] These APPs could be used as a prognostic factor to assess treatment response in this species. However, interspecies