

A Novel Disinfectant in Psittacine Respiratory Disease

John Chitty BVetMed CertZoomed CBiol MIBiol MRCVS

Session # 1080

From: Strathmore Veterinary Clinic, London Road, Andover, Hants. SP10 2PH, UK

Abstract: Respiratory disease is commonly seen in avian practice, including sinusitis, rhinoliths and air sacculitis. Therapy of these conditions usually involves drugs given systemically or by nebulisation. F10 is a complete-spectrum disinfectant with six active constituents. It is non-toxic and non-irritant to tissues. F10 has been used as a sinus flush for sinusitis (generally with no requirement for systemic therapy) and nebulised in lower respiratory disease. It appears safe and efficacious against aspergillosis in African Greys.

Key Words: psittacine, respiratory disease, sinusitis, aspergillosis, F10, disinfectant, nebulisation

Introduction

Respiratory disease is a common finding in avian practice.¹⁻³ These diseases are classed according to site as upper or lower respiratory tract disease (URTD or LRTD).^{1,3,5} The definition of upper and lower respiratory tracts varies according to author, with some classifying upper as those structures in the head, and lower as all structures below.^{1,3} Others describe the upper respiratory tract as ending at the syrinx, below this being the lower respiratory tract.^{4,5} In this paper the former categorization will be used. These may be further divided into rhinitis/ nasal irritation and sinusitis (URTD) and tracheitis/ tracheal disease and pneumonia/ air sacculitis (LRTD).¹ There are many causes of respiratory disease, including: infectious (bacterial, viral, fungal, protozoal, parasitic, chlamydial), irritants (eg. tobacco and other smokes, air fresheners, dust), neoplasia, allergy, foreign bodies, trauma. In addition, low ambient humidity and malnutrition (especially hypovitaminosis A) may predispose to problems.¹⁻⁵ It is thus vital that all cases of respiratory disease in these birds are thoroughly investigated to allow accurate diagnosis and so commence correct therapy. The avian respiratory system is extremely complex,⁶ which permits deposition of pathogenic organisms (eg. *Aspergillus* spores in the caudal air sacs) where they are relatively difficult to access with therapy.² It also allows pus to collect in air sacs or sinuses where it cannot drain. This may form a nidus of infection as well as acting as a foreign body. This, in part, explains the difficulties in successfully treating avian respiratory disease even when an accurate diagnosis has been reached. It also means that systemic therapy is often unsuccessful when used on its own. Delivery of drugs directly onto respiratory surfaces by nebulisation or sinus flush is often essential for successful therapy. In particular, aspergillosis is extremely difficult to treat. This may be due to difficulties in diagnosing this condition,⁷ concurrent immunodeficiency, toxin production by the fungus,⁸ and the formation of fungal colonies and granulomata in areas relatively inaccessible to therapy. Grey parrots seem particularly prone to aspergillosis.² They are also very sensitive to itraconazole, one of the "standard" anti-fungal drugs.^{2,8} It is suggested that this may be due to differences in plasma binding between species,⁸ and that lower dosages should be used in grey parrots.^{2,8} However, in the author's experience, toxicity may still be seen. Nebulisation of many drugs has been used for respiratory infections.^{3,5} Some of these, eg. amphotericin-B, gentamycin have a low therapeutic index when used systemically. Poor

absorption from the air sac surfaces enable these drugs to be used safely by nebulisation. However, the health and safety of those working with the birds who may also inhale these drugs is a major issue. The difficulties in treating this condition have resulted in many different therapies being suggested and used with no "standard" treatment modality.

F10

F10 Super Concentrate Disinfectant ("F10") is produced by Health and Hygiene (Pty) Ltd in South Africa. It was originally developed for disinfection within pharmaceutical plants particularly aseptic fill areas (eg. intravenous drips). It is a complete spectrum virucidal, bactericidal, fungicidal and sporicidal aldehyde-free compound of six main active ingredients. The exact formula remains a commercial secret but does contain quaternary ammonium and biguanide compounds (5.8%), non-toxic ampholytic surfactants and sequesterants. Its use in a fogging system to prevent and treat aspergillosis in falcons was described by Verwoerd (2001).⁹

Uses of F10

Sinus flush

Sinus flushing is very effective for treatment of URTD. A simple technique is described by Forbes (1996).³ In this technique a dilute solution of enrofloxacin is used. Naturally this is only effective for bacterial infections sensitive to this drug, and the description states that this is the drug of choice prior to culture/ sensitivity results. It is also important that underlying causes are addressed (hypovitaminosis A, airborne irritants/ allergens, etc).

Use of a 1:250 or 1:500 dilution of F10 has resulted in resolution of URTD caused by bacteria and fungi, often without the need for systemic antimicrobial therapy.

It has been especially useful after rhinolith removal, where twice-weekly sinus flushing with F10 has been used without systemic therapy. Several of these cases in Grey parrots have been caused by infection with *Aspergillus* spp.

Nebulization

Nebulization of F10 has been used for a variety of LRTD where an infectious cause is present or suspected.

10ml of a 1:250 dilution is nebulised over 20-30 minutes three times daily.

Nebulization is used as part of a combined therapy in these cases.

It has proven of great use in treating aspergillosis in Grey parrots in combination with oral terbinafine. This combination, used over 3-4 months has resulted in clinical cure in several birds.

Nebulized F10 has been very well tolerated by patients. F10 is safe to humans and is used for disinfection in food manufacture in South Africa. It is also non-corrosive to metal or plastic and non-irritant to tissues.⁹ These properties, alongside its broad spectrum of antimicrobial activity make it an ideal agent to nebulize.

In the author's practice all birds presenting with signs of respiratory disease are nebulized with F10 as part of the initial stabilization prior to diagnostic investigation. Nebulization will be continued using the protocol described above as part of any antimicrobial therapy.

Intra-tracheal

Following endoscopic removal of syringeal aspergillomata, flushing of the operation site with a 1:250 dilution of F10 has been performed. Follow-up therapy involving systemic anti-fungal drugs and F10 nebulization has resulted in clinical cure.

Adverse reactions

Using dilutions of 1:250 and 1:500 no adverse reactions have been seen using any of these techniques. One Indian Ring-necked parakeet (*Psittacula krameri*) had swelling of the head and respiratory distress after sinus flushing with a 1:50 dilution. Symptoms quickly abated after re-

flushing with a solution of 0.5mg betamethasone sodium phosphate (Betsolan Soluble; Schering-Plough) in 10ml sterile water for injection. The sinuses were flushed again a few days later using a correct dilution of 1:250 F10 and there were no adverse effects.

Conclusion

As with all new therapies, especially those used in conjunction with other treatments, it is difficult to fully assess the effects of F10 in these cases, however it appears to be safe to birds and people and seems effective in the treatment of infectious causes of psittacine respiratory disease. Further evaluation is, of course, required.

Contact Address: Health and Hygiene (Pty) Ltd, PO Box 347, Sunninghill, 2157, South Africa.
Tel. +27 11 472 4372; Fax +27 11 472 4211

References

1. Hillyer EV. Clinical Manifestations of Respiratory Disorders. In: Altman RB, Clubb SL, Dorrestein GM, Quesenberry K. Philadelphia, PA: WB Saunders; 1997: 394-411.
2. Phalen DN. Respiratory Medicine of Cage and Aviary Birds. Veterinary Clinics of North America: Exotic Animal Practice. 2000; 3: 423-452.
3. Forbes NA. Respiratory Problems. In: Beynon PH, Forbes NA, Lawton MPC. Shurdlington, UK. BSAVA. 1996: 147-157.
4. Morrissey JK. Diseases of the upper respiratory tract of companion birds. Seminars in Avian and Exotic Pet Medicine. 1997; 6:195-200.
5. Clippinger TL. Diseases of the lower respiratory tract of companion birds. Seminars in Avian and Exotic Pet Medicine. 1997;6:201-208.
6. Heard DJ. Avian respiratory anatomy and physiology. Seminars in Avian and Exotic Pet Medicine. 1997;6:172-179.
7. Jones MP, Orosz SE. The diagnosis of aspergillosis in birds. Seminars in Avian and Exotic Pet Medicine. 2000; 9:52-58
8. Orosz SE. Overview of aspergillosis: pathogenesis and treatment options. Seminars in Avian and Exotic Pet Medicine. 2000;9:59-65
9. Verwoerd D. Aerosol use of a novel disinfectant as part of an integrated approach to preventing and treating aspergillosis in falcons in the UAE. Falco. 2001;17:15-18