A REVIEW OF MYCOPLASMOSIS INFECTIONS IN TORTOISES AND OPTIONS FOR TREATMENT

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Abstract: An upper respiratory tract disease caused by mycoplasma organisms is present in many captive and wild populations of tortoises. The disease is characterized by a variety of symptoms including conjunctivitis, nasal discharge, wheezing, choanal inflammation, anorexia, and cachexia. Most tortoises show signs of clinical improvement with the use of chemotherapeutics. A variety of different chemotherapeutics and methods of therapy are available for the treatment of this disease. In human medicine tetracyclines and some of the new macrolides are the drugs of choice for mycoplasma infections. These antibiotics can also be used for the treatment of mycoplasmosis in tortoises. Other adjunctive treatments such as topical therapy, rehydration, and appetite stimulation may also be beneficial in the treatment of this disease.

Key words: chelonian, tortoise, mycoplasma, upper respiratory tract disease, antibiotics, chemotherapeutics, clarithromycin, oxytetracycline.

INTRODUCTION

Upper respiratory tract disease (URTD) is one of the more common illnesses in tortoises. Mycoplasma agassizii and another yet unnamed mycoplasma species have been identified as causative agents of the disease (Jacobson, 1994, Jacobson, 1997). The mycoplasmas infect the mucosal membranes and respiratory tract causing a significant immune mediated inflammatory response in many tortoises (Jacobson, 1997). Secondary bacterial infections can also occur causing an increased severity of clinical signs. Clinical signs can range from conjunctivitis, mild wheezing, serous nasal discharge, erosion and scarring of the nares and choanal inflammation to more serious pneumonia-like symptoms. Different species of tortoises appear to have different
levels of morbidity and mortality from the disease. Some tortoises are found to have recurrent bouts of illness and others have single episodes. Most tortoises clinically improve with the use of chemotherapeutics.

OPTIONS FOR TREATMENT

Enrofloxacin (Baytril, Bayer Corporation, Shawnee Mission, KS) is probably one of most commonly used chemotherapeutics for URTD in tortoises. Reported dosages range from 5 mg/kg i.m. q 1-5 d (Gauvin, 1993. Prezant, 1994). The authors personally use 5 mg/kg i.m. q 48-72 hr. Quinolones have fair activity against mycoplasmas and the added benefit of minimal anaerobic activity thus not disturbing the fermentative gastrointestinal flora of tortoises. Some investigators believe that the large scale use of fluoroquinolones in veterinary medicine over the past several years may be partially responsible for the resistance now seen in multiple gram negative pathogens. Some microbiologists specializing in mycoplasma research recommend the use of tetracyclines and some of the new macrolides as potentially better options for the treatment of mycoplasma infections (Tully, 1998).

A recent pharmacokinetic study of the macrolide clarithromycin (Biaxin, 50 mg/ml, Abbott Park, IL) has been performed in the desert tortoise, Gopherus agassizii. A dose of 15 mg/kg p.o. q 48-72 hr will achieve appropriate plasma concentrations above many reported mycoplasma minimum inhibitory concentration values (Wimsatt, In press). This antibiotic has been shown to have significant potency against human mycoplasmas (Ishida, 1994). In humans, clarithromycin has been shown to cause much less gastrointestinal upset than erythromycin. Clarithromycin also appears to concentrate in the cells and secretions of the respiratory tract (Conte, 1995). No gastrointestinal disturbances or adverse effects have been seen in tortoises treated with this antibiotic.

We have also used oxytetracycline (Liquamycin LA200, 200 mg/ml, Pfizer, New York, NY) in desert tortoises for treatment of URTD with some success. A dose of 5-10 mg/kg i.m. q 24 hr has been used (Gauvin, 1993). Preliminary studies of oxytetracycline in the American alligator, Alligator mississippiensis, have shown that a dose of 10 mg/kg i.v. q 96 hr and possibly up to q 10 d, may be effective against Mycoplasma lacertii infections (Helmick, 1997). Pharmacokinetic data of tetracycline plasma half-life in tortoises has not been reported. Caution must be taken to insure tortoises are well hydrated throughout treatment to prevent the risk of nephrotoxicity. All tortoises with signs of dehydration should have this problem corrected. We do not recommend that all tortoises with URTD be treated with macrolides or tetracyclines, however they can be a good option to decrease the over use of enrofloxacin or for refractory cases.

Amoxicillin (Amoxi Drops, 50 mg/ml, SKBeecham, Westchester, PA) is not an appropriate antibiotic for use in tortoises with URTD. Amoxicillin’s main mechanism of action is to inhibit cell wall synthesis. Mycoplasmas have no cell wall and are therefore not affected by this family of drugs. Many gram negative pathogens such as Pseudomonas spp are also resistant to amoxicillin.

Topical therapy in the eyes and nares can also be a beneficial adjunctive or alternate way of treatment. Since a significant part of the disease process is the inflammatory response, steroid plus antibiotic drops such as gentamicin and betamethasone (Gentocin Durafilm Solution,
Schering-Plough Animal Health Corp., Kenilworth, NJ) may help significantly. It is the authors' belief that the most significant benefit is provided by the steroid. However, gentamicin may provide effective topical therapy for many of the secondary pathogens associated with mycoplasma infections. Generally one to two drops are applied to both eyes q 12-24 hr. The authors have found reverse nasal flushes with this ophthalmic solution also to be effective in hastening the resolution of nasal discharge. The technique consists of grasping the tortoise behind the head (chemical restraint may be necessary in resistant individuals), then overturning the tortoise so that it rests on its carapace. The mouth is opened by applying steady downward (or in this case upward) pressure to the chin. The lower beak is then held so that the mouth is wide open and the choanae are fully exposed. The choanae are flooded with gentamicin/betamethasone solution. The mouth is then closed and digital pressure is applied to the intermandibular area to force the tongue into the choanae. This flushes the solution, mucus, and debris rostrally through the nares. The tortoise is then rotated back to an upright position and intermandibular pressure is reapplied completing the flushing process. This procedure is repeated q 48-72 hr. In most cases, this technique used in conjunction with effective systemic antimicrobial therapy will resolve nasal discharge within 10-14 d. In some early or mild cases the use of these drops alone are sometimes enough to resolve clinical signs. The authors (JDJ, BAM) have found that for cases where the above procedure can not be performed, application of these drops directly into the external nares q 12-24 hr has had some benefit.

Trephination of the sinus cavities has been suggested as an option for cleaning and applying topical therapy for tortoises with chronic infections (Jacobson, 1997). The authors have not had a case requiring this therapy.

For severely cachexic animals the use of cisapride (Propulsid, 10 mg tablets, Janssen Pharmaceutical Inc., Titusville, NJ) 1.0 mg/kg p.o. q 24 hr may be of benefit in turning around gastrointestinal stasis and stimulating appetite in some cases. Tablets can be dissolved in water to make dosing and administration easier. Cardiac problems have been reported in a small percentage of humans who have taken cisapride and clarithromycin together (PDR, 1998). The authors suggest that these two drugs not be used in combination in tortoises. We recommend trying some of the above options as alternative methods of treatment or for non-responsive cases of URTD in tortoises.
REFERENCES


