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Dermatology in reptiles

Frank Pasmans

DVM, PhD, MSc, Dipl ECZM (herpetology), Ghent (B)

Tom Hellebuyck, DVM, Ghent (B) An Martel, DVM, PhD MSc, Ghent (B)

INTRODUCTION

Skin diseases represent one of the most important reasons for veterinary intervention in reptile medicine. Whereas most skin diseases in commonly kept reptile species are primarily caused by inappropriate husbandry and feeding, few infectious agents that primarily cause dermatitis are known. In this manuscript, we will focus on one bacterial (Devriesea agamarum) and one mycotic (Nannizziopsis vriesii) agent involved in severe and persistent dermatological problems in collections of captive reptiles.

CANV

Dermatomycosis caused by the Chrysosporium anamorph of Nannizziopsis vriesii (CANV) is a frequently observed and a difficult to treat disease problem in several captive reptile species. CANV infections typically present as skin discolouration, whether or not associated with hyperkeratosis and the formation of granulomata. In contrast to most dermatophyte associated diseases, CANV infections, if left untreated, often result in systemic spread causing death of the infected animal. CANV infections can be easily diagnosed by culture of the organism from clinical samples (skin lesions, granulomata). When culturing the fungus, one should bear in my mind an incubation period of 7-14 days at 30°C is needed for visible growth. Previously, clinical cure of CANV infection was established after itraconazole administration in a Parson's chameleon (Chamaeleo parsonii, Paré et al., 1997) and in a bearded dragon (Pogona vitticeps, Bowman et al., 2007) and following ketoconazole treatment in two green iguanas (Iguana iguana, Abarca et al., 2008). In salt water crocodiles (Crocodylus porosus) debridement of dermal lesion combined with iodine-based antiseptic betadine swabbing and formalin bathing eliminated CANV infection (Thomas et al., 2002). Nevertheless, therapeutic failure has repeatedly been reported in reptiles suffering from CANV infection, even in spite of the use of antimycotics (Bertelsen et al., 2005; Bowman et al., 2007; Martel et al., 2006; Nichols et al., 1999; Paré et al., 1997; Thomas et al., 2002). This might be at least partly explained by the lack of knowledge concerning drug susceptibility patterns of Chrysosporium species and pharmacokinetics of antifungal drugs in reptiles.

Antimycotic resistance against itraconazole and hepatotoxicity of itraconazole have been observed (Van Waeyenberghe et al., 2010). Voriconazole proved to be a safe and effective antimycotic drug to treat CANV infections in lizards at a dose of 10 mg/kg BW q24h (Hellebuyck et al., 2010; Van Waeyenberghe et al., 2010). Despite the long treatment duration needed, the higher survival rate of the infected animals and the complete clearance of CANV currently makes this the treatment of choice. However, in case of systemic infections, prognosis remains poor. Besides antimycotic treatment, elimination of predisposing factors should be achieved and a regular follow up should be carried out to confirm the absence of the fungus.

DEVRIESEASIS

Devriesea agamarum is a Gram positive, small rod, belonging to the class Actinobacteria (Martel et al., 2008), that causes dermatitis in lizards (P. vitticeps; Hellebuyck et al., 2009a). Probably, the disease is most often secondary to e.g. poor husbandry.

D. agamarum causes chronic proliferative dermatitis, especially in agamid lizards. Lesions typically occur around the oral cavity, but also the pericloacal region and the legs are frequently involved. Septicaemia is a frequent complication and results in the death of the affected animal. Certain saurian taxa appear to be highly sensitive to the disease, especially dab lizards (genus Uromastyx), rock agamas (genus Laudakia), agamas (genus Agama) and Crotaphytus sp. An infection with D. agamarum in a captive collection of one of these lizard taxa may lead to high morbidity and mortality. In contrast, other taxa such as bearded dragons (genus Pogona) appear to be much less sensitive to D. agamarum associated disease. We have strong indications that bearded dragons are a major asymptomatic reservoir of D. agamarum infection for other lizard species.

We recently showed that D. agamarum is able to persist for very long times in the environment: up to 57 days in dermal crusts and more than 3 months in moist sand at 20 or 30°C. In contrast, survival on dry surfaces is limited. This finding emphasises the need for a dry environment for most desert lizards. Indeed, the moist retreats as proposed in older literature for desert dwelling lizards, are definitely not nec-



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essary for the wellbeing of at least dab lizards. The authors have been keeping and breeding several *Uromastyx* species for almost 20 years, without providing any moisture, except for dietary vegetables.

Diagnosis is based on a combination of clinical signs and the isolation of the bacterium from dermatitis lesions and blood in living specimens or skin or organ lesions in deceased animals. *D. agamarum* grows in small haemolytic colonies under aerobic, microaerobic or anaerobic conditions at temperatures between 25 and 42°C.

A treatment schedule of intramuscular ceftiofur injections at 5 mg/kg body weight q24h was successful in eliminating both clinical signs and *D. agamarum* in experimentally and in naturally infected bearded dragons and dab lizards within 18 days (Hellebuyck et al., 2009b). However, prognosis is mostly poor in lizards with a systemic infection of *D. agamarum*. Besides antimicrobial treatment, it is of major importance to correct any predisposing factors such as husbandry shortcomings. Besides diet, proper heat, (lack of) moisture and lighting, especially dab lizards are highly prone to cage mate associated stress. Although this is not always obvious, social stress will lead to poor performance of the subdued animal.

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Address for correspondence:

Frank Pasmans

Laboratory of Veterinary Bacteriology and Mycology & Division of Poultry, Exotic Companion and Laboratory Animals, Department of Pathology, Bacteriology and Avian Diseases, Faculty of Veterinary Medicine, Ghent University, Belgium