MEDICAL TREATMENT OF AVIPOXVIRUS INFECTIONS IN BIRDS OF PREY

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ABSTRACT

Poxviruses are double-stranded DNA enveloped viruses that infect a wide spectrum of animals. Poxvirus infections in birds are caused by a large avipoxvirus. This infection (mostly dry form) is now seen more frequently in Spain, and considered common in falconry birds in Europe and Middle East. Until now most of the treatment options were surgical. We treated more than 150 raptors infected by poxvirus with a monoglyceride (monolaurin – glycerol monolaurate) to treat over 150 birds of prey observing clinical remission without or with little sequels. PCR and histopathology on some cases confirmed the poxvirus infection.

1 INTRODUCTION

Avian pox is caused by DNA enveloped viruses of the genus Avipoxvirus. Avian poxviruses cause infection in a broad spectrum of domestic and wild birds. At least 232 avian species of 23 orders are sensitive to avipoxvirus infection (BOLTE et al. 1999). To date 10 species of avipoxviruses have been characterized (MOYER et al. 2000). Avipoxviruses, which cause infection also in a number of other avian species, need to be characterized in greater detail both from the genetic and biological properties viewpoints. Although most of these viruses are considered relatively host specific, some species can infect multiple avian species from a similar geographic range (LÜSCHOW et al. 2004).

Clinical manifestation of the disease in raptors in Spain is mainly cutaneous and diphtheritic forms, being more often prevalent in juvenile birds in the autumn months (September to November) (M.G.M., unpublished data, October 2010). Although is more frequent a self-limited disease and is not considered fatal to captive falcons (SAMOUR and NALDO 2001) they frequently lose their fitness level and sometimes the disease renders them useless for falconry.

Published treatment options of cutaneous pox lesions in birds involve electrocauterization (SAMOUR and COOPER 1993), application of lipid solvents (SAMOUR and COOPER 1993), thermocauterization (LIERZ 2000), surgical debridement with application of a hydrocolloid dressing (SAMOUR and NALDO 2001), and surgical debridement and virustatic treatment with famcyclovir (OCHS et al. 2005).

In this clinical trial a highly purified monoglyceride, alone or in combination with a broad spectrum antibiotic course was administered orally to 162 birds of prey infected with an avipoxvirus from 2008 to 2010 in Spain.

2 MATERIAL AND METHODS

One hundred sixty two hundred captive birds of prey of 10 species and their hybrids were included in this clinical trial. Birds were presented to a private raptor hospital or were captive bred at a large commercial breeding centre. Monolaurin (Booster concentrate, Healx, Harrisons´ pet products, Florida, USA) was administered orally in the food daily for 30 days in 148 birds and to a maximum of 65 days to the rest. If the lesions were infected a 7 days course of a broad spectrum antibiotic was prescribed.

Poxvirus infection was diagnosed in 25 cases by histopathology and PCR procedure. Blood was obtained from these birds and processed and tested according to a protocol, before and after the treatment.

3 RESULTS

All the birds recovered from the infection uneventfully. Most of the small lesions disappeared within 15 days and from 30 to 65 days was needed for the more complicated diphtheritic and cutaneous clinical cases.

4 DISCUSSION

The antiviral action attributed to monolaurin is that of fluidizing the lipids and phospholipids in the envelope of the virus, causing the disintegration of the microbial membrane. Another antimicrobial effect in viruses is due to lauric acid's interference with virus assembly and viral maturation (HORNUNG et al. 1994).

In this clinical trial all the birds recovered from the infection without or with little sequels. However, more studies with this product are warranted in other countries with different poxvirus strains and raptors.

CITATION INDEX

1. BOLTE AL, MEURER J, KALETA EF. Avian host spectrum of avipoxviruses. Avian Pathol. 1999;28:415-432.
2. MOYER RW, ARIF BM, BLACK DN, ET AL. Family Poxviridae. In: van Regenmortel MHV, Fauquet CM, Bishop DHL, Carstens EB, et al. eds. Virus taxonomy, Classification and Nomenclature of Viruses, Seventh report of the International Committee on Taxonomy of Viruses. San Diego, CA: Academic Press; 2000:137-157.
3. LÜSCHOW D, HOFFMANN T, HAFEZ HM. Differentiation of avian poxvirus strains on the basis of nucleotide sequences of 4b gene fragment. Avian Dis. 2004;48:453-462.
4. SAMOUR J, NALDO J. Therapetic management of pox lesions on the cere of captive falcons. Proc Annu Conf Assoc Avian Vet. 2001:233-236.
5. SAMOUR JH, COOPER JE. Avian pox in birds of prey (Order Falconiformes) in Bahrain. Vet Rec. 1993;132: 343-345.

6. LIERZ M. Posssible therapy for early pox lesions. Proc Int Conf Exotics. 2000: 88-90.
7. OCHS A, AUE A, HENTSCHKE J, WITTSTATT U, BURKHARDT S. Successful surgical and virustatic therapy of timorous avipoxvirus infection in an Andean (*Phoenicoparrus andinus*) and James flamingo (*Phoenicoparrus jamesi*) at Berlin zoo. Verh.ber. Erkrg. Zootiere. 2005;42:86-91.
8. HOMUNG B, ARNTMANN E, SAUER G. Lauric acid inhibits the maturation of vesicular storriatitis virus. J Gen Virol 1994;75:353-361.

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