An Outbreak Of Low Pathogenic Avian Influenza In A Mixed-species Aviculture Unit In Dubai

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Introduction

We describe an outbreak of low pathogenic H9N2 avian influenza virus (AIV) in two white-bellied bustards (WBB) (*Eupodotis senegalensis*), one stone curlew (SC) (*Burhinus oedicnemius*) and a blacksmith plover (BP) (*Anitibyx armatus*) in a private collection in the United Arab Emirates. The four birds showed signs of respiratory disease and all died as a result of disease or euthanasia. Avian influenza virus has not been previously described in these species.

Clinical findings

Clinically affected birds showed a reduction in food consumption and general lethargy with individual birds exhibiting varying degrees of tachypnoea and dyspnoea, ranging from mild respiratory signs to open-mouthed breathing and collapse (Fig.1). Ocular and nasal discharge was obvious in two cases (white-bellied bustard and stone curlew).

Clinicopathological investigations

Clinical samples were collected from affected live birds. The four clinically affected birds were screened for AIV from pooled oropharyngeal-cloacal swabs and for isolation of whole virus from post-mortem tissues. Viral antigen was detected using Directigen Flu A antigen-capture ELISA (Becton-Dickinson, USA). Sub-type was confirmed by identification of serotype-specific influenza viral antibody in serum samples by haemagglutination inhibition tests.

Post-mortem examination

Catarrhal to suppurative bronchopneumonia was seen in the SC and mild demyelinisation was found in the brain of the BP. Both WBBs showed no lesions typical for AIV. Influenza virus type A was isolated in tissues from all four dead birds and was confirmed as subtype H9N2 in two cases.

Diagnosis

A diagnosis of AIV subtype H9N2 was made based on the clinical signs and isolation of the virus from clinical and pathological specimens. Bacterial and fungal isolates were considered to be secondary opportunistic bacteria and fungus, which were unlikely to have been the primary cause of disease or mortality.

Treatment of other affected birds in the rearing unit

Four further birds (3 WBBs and one SC) displayed non-fatal disease with lethargy, inappetence and serous ocular and nasal discharge. These birds were treated orally with 10 mg/kg osetamivir phosphate (Tamiflu®, Roche) q12h for 5 days and all recovered. The affected rearing unit was fogged (with the birds contained inside) twice daily for two weeks, using F10 disinfectant, at a dilution of 1 part per 125.

Follow up screening of birds in the aviculture unit

Following confirmation of AIV in cases 1-4, the remaining 58 birds in the rearing unit were screened for AIV antigen, using ELISA on pooled oropharyngeal and rectal swabs.


Fig. 1

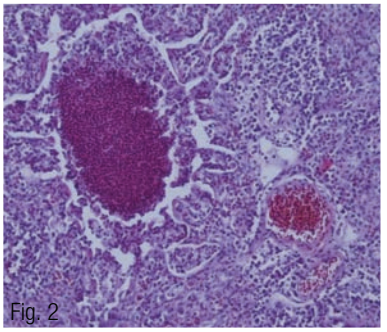
Fig. 2

Fig. 1. Stone curlew with avian influenza in severe respiratory distress. (© T. Bailey)
Fig. 2. Lung of Stone curlew (id 4) with catarrhal to suppurative bronchopneumonia (© J. Kinne)

A pooled sample from four birds, showing mild upper respiratory signs (cases 5-8), was ELISA positive. Swabs, repeated after 7 days administration of Tamiflu®, were negative for influenza viral antigen. Influenza is a virus belonging to the family Orthomyxoviridae and can be divided into types A, B and C. Only type A is of veterinary importance and the Organisation on Infectious Epizootics classifies AIV as high pathogenic AIV or low pathogenic AIV according to the virulence of the isolate for domestic poultry (World Organisation for Animal Health, 2004). Influenza A has recently been implicated as the cause of mass avian mortalities worldwide and as the potential aetiology for major pandemics amongst human populations (*Capua et al*, 2004). Therefore, the isolation of a H9N2 avian influenza subtype from a previously healthy group of birds was a cause for concern.

Congregations of aquatic birds are thought to form a major reservoir of AIV and their migration has been shown to contribute to the carriage of the virus around the world. The aviculture unit reported here was situated adjacent to lakes, which accommodated large numbers of free-flying waterfowl. Once contaminated, the survival time of AIV in muddy waters is unknown but such water bodies should also be considered a possible source of infection. One possible route of AIV infection into the rearing unit was from the birds that were occasionally housed outdoors and brought into the rearing unit at night. Other possible modes of indirect transmission of AIV include contaminated fomites and material carried by personnel working in the rearing unit or contaminated water supplies.

Although the AIV, responsible for the outbreak reported here, was identified as being a low pathogenic strain and the majority of birds within the unit remained healthy, the severity of disease seen in the four clinical cases serves to highlight the potential significance of AIV to bird populations worldwide.

References:

References may be found in the full version of this paper published as: Kent et al. (2006) - An Outbreak of Low Pathogenic Avian Influenza in a Mixed-species Aviculture Unit in Dubai in 2005. Veterinary Clinics of North America. 9(3):523-31. A pre-publication proof of the article is available for download at the WME News website.

Editors note:

The science of vaccination is affected by a great deal of factors including host susceptibility, pathogen virulence, environmental factors, group size, group demographic and species targeted. For more information on how to develop vaccination protocols for your collection please contact editors@wmenews.com