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Monitoring Emergent Avian Influenza Viruses Subtypes H5 and H7 in Wild Birds in Ukraine

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Objective

To carry out monitoring studies of circulation of the AIV subtypes H5 and H7 in wild waterfowl and shorebirds around the Azov-Black Sea in Ukraine

Introduction

To date, avian influenza virus (AIV) is an unpredictable pathogen affecting both animals, birds and people. The regular emergence of new strains and variants with different properties and pathogenicities requires additional monitoring and careful research of those viruses. It is known that wild birds— especially waterfowl and shorebirds— are the main and primary reservoir of AIV in nature which makes epizootological monitoring of populations of these birds necessary.

Methods

Sampling of wild birds was conducted in the Azov-Black Sea region of Ukraine. During the period from 2000 to 2011, biological material (cloacal, tracheal swabs, fecal samples) was collected from more than 6000 wild birds of 66 different species of orders *Anseriformes* and *Charadriiformes*. Virological investigations were carried out by standard methods recommended by the OIE (isolation in chicken embryos with identification by HI-test and PCR).

Results

Since year 2000, in the Azov-Black Sea region of Ukraine the monitoring of influenza viruses in wild waterfowl and shorebirds was being organized by scientists from the National Scientific Center Institute of Experimental and Clinical Veterinary Medicine (NSC-IECVM). Particular attention was paid to the circulation of AIV subtypes H5 and H7, which can potentially be devastating to poultry.

During the period of years 2005-2008 highly pathogenic avian influenza (HPAI) viruses subtype H5N1 were detected in wild birds in Ukraine. Five isolates of H5 subtype were isolated from great cormorants (*Phalacrocorax carbo*) in 2006 and 3 viruses from great grebes (*Podiceps major)* in 2008. Phylogenic analysis showed that these viruses originated from Asia, and Western Europe respectively.

During 2010-2012, 59 different subtypes of influenza viruses were isolated, including a low pathogenic avian influenza (LPAI) virus subtype H5N2. Seven H7 subtype viruses with different neuraminidase enzymes (H7N3, H7N6, H7N7) were isolated, representing 11.86% of the total number of all AIV isolated from samples.

All viruses of subtypes H5 and H7 were isolated from the wild Mallards during their autumn migration and wintering in the Azov-Black Sea region. These viruses did not cause disease in chickens after intranasal and intramuscular inoculation.

Conclusions

In summary, our results demonstrated the circulation of LPAI viruses subtype H5 and H7 in wild waterfowl populations in the Azov-Black Sea region. These findings support the need for ongoing monitoring of avian influenza for early prevention of HPAI viruses that may pose a threat to poultry.

Keywords

avian influenza virus; surveilance; wild birds

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