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Case Report

Isolation of Newcastle Disease Virus in Migratory Wild Bird in a Wetland Area of Taraba State Nigeria

MESEKO, C.[1] and MOSES, G.[2]

[1]Viral Research Department, and [2]Central Diagnostic Department, National Veterinary Research Institute, Vom.
Correspondence:cameseko@yahoo.com; Tel:+2348039183988

INTRODUCTION

Migratory wild birds were not earlier considered important in the transmission of viruses particularly avian influenza until 1997 when they were implicated in the spread of highly pathogenic avian influenza (HPAI) in Hong Kong parks and the virus was subsequently detected in many other captive and wild birds (Ellis *et al*., 2004). Current evidence shows that some migratory waterfowls are natural reservoirs and can asymptomatically transmit infectious viruses (Sturm-Ramirez *et al*., 2005). Migratory wild birds are thus able to spread virus to locations which had had no prior infection (Keawcharoen *et al*., 2008). Some of these birds are found globally, particularly in wet lands with the birds migrating between habitats for short distances or involved in intercontinental movement (Fouchier, *et al*., 2007). The outbreak of HPAI in Asia and Eastern Europe in the last decade raised concerns about the role these birds may play in the introduction of the virus to Nigeria. This is because the country lays within two prominent migratory fly ways namely north Atlantic and east pacific beside abundant wetlands and natural habitats in country (Obi and Olubukola, 2008). When avian influenza virus was eventually detected in Nigeria in 2006, it was alleged to have been introduced through multiple sources including migratory wild birds (Ducatez *et al*., 2006). In this case report, we show evidence of infection and isolation of Newcastle disease virus in migratory wild bird in a wetland area of Taraba State Nigeria in the course of a nationwide passive surveillance for avian influenza virus.

KEYWORDS: Newcastle disease, virus, isolation, raptor, migratory.

CASE REPORT

In November 2009 near a fishing lake in Karim Lamido village Taraba State, Nigeria (9° 18' 13.47" N and 11°12' 50.57" E), a fisherman caught two eagles (raptors), one had an identification tag on its leg numbered 258211, showing it originated from Helsinki zoo in Finland, the other had no tag thus its origin could not be ascertained. No overt clinical signs indicative of any disease were observed in both raptors, however cloacal and tracheal swabs were collected ante mortem and shipped along with the carcasses to the National Veterinary Research Institute (NVRI) Vom when the birds died five days post quarantine apparently due to stress. Rapid antigen detection was performed using AIV Ag test (anigen test® kit, South Korea) for influenza type A on cloacal swabs as described by Meseko *et al*. (2010). The specimens were thereafter inoculated in 10 day-old chicken

embryonated egg sourced from specific antibody negative (SAN) flock and incubated at 37°C for five days. Gross pathological examination was also performed with scanty evidence of hemorrhages on the viscera of both carcasses. These parenchymatous tissues were harvested and processed for virus isolation also in embryonated chicken eggs. Haemagglutination Inhibition (HI) test was carried out on allantoic fluid harvest from dead embryo that agglutinated chicken red blood cell in a rapid haemagglutination (HA) test as described in OIE Manual (2008). Monoclonal antiserum to Newcastle disease virus used in this work was sourced from National Veterinary Service Laboratory (NVSL) Ames Iowa. The pathogenicity of the isolate was also assessed by mean death time (MDT).

RESULTS

The cloacal swabs were negative for influenza A by rapid antigen detection test. Newcastle disease virus was however isolated from both cloacal and pooled parenchymatous tissue of the bird with identification tag and was positively identified by HI. Preliminary pathological index by MDT showed that the isolate from this migratory raptor caught in Nigeria was avirulent (MDT > 80 hours).

DISCUSSION

Studies in the past have shown recovery of Newcastle Disease Virus (NDV) of velogenic strain from birds of prey that died in captivity (Chu *et al.*, 1976). In a survey on the ecology of influenza, avirulent Newcastle disease viruses were also isolated from various species of ducks, shearwaters, noddies, terns and coot (Mackenzie *et al.*, 1984). Haruna *et al.* (1993) has also reported isolation of velogenic Newcastle disease virus from guinea fowls in Nigeria which was identified by conventional biological pathotyping of mean death time (MDT). Molecular pathotyping and nucleotides sequencing which was not available as at the time of this observation may be able to show relevant mutations that could cause reversal to virulence. This case has no immediate economic or public health threat but is however significant in demonstrating the importance of migratory birds as harborer and potential transmitter of infectious pathogens from Europe or other part of the world to Nigeria. Migratory birds either from Europe or Asia has also been sighted in other places in Nigeria in the past. For instance a homing pigeon from Britain was caught in Sagbama area in Bayelsa State and a falcon from Finland was also caught in Sokoto, though no virus was isolated from either case (Obi *et al*, 2005). In the course of avian influenza outbreaks in Nigeria (2006-2008), a highly pathogenic avian influenza H5N1 was isolated from a healthy duck in Gombe State. Phylogenetic analysis of the virus that was carried out in a reference laboratory oversea further showed that the virus clustered with sub lineage III from Europe and Middle East and sequence analysis of the gene segments showed highest similarity at nucleotide level with a migratory goose-Cygnus olor/Czech Republic with 99.3% HA; 99.8% NA and 100% M genes homology (Fusaro *et al.*, 2009). In the light of the knowledge that avian influenza and Newcastle disease viruses share many clinico-pathological and epidemiological similarities, the isolation of Newcastle disease virus in a migratory eagle underlines the importance of migratory birds as potential transmitter of infectious pathogens of economic and public health importance and the need for continuous surveillance and monitoring of migratory wild bird ecology in Nigeria.

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