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Review of highly pathogenic avian influenza outbreaks in poultry in Zaria, Nigeria

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Abstract

All the confirmed highly pathogenic avian influenza cases that were diagnosed in Zaria at the Veterinary Teaching Hospital, Ahmadu Bello University, Zaria, Nigeria, were reviewed in this study. The outbreaks occurred between the months of December, 2006 and March, 2007. The clinical signs and postmortem lesions were similar to those observed in avian influenza outbreaks elsewhere. It was observed that the cold windy harmattan condition, the addition of new birds into an already existing flock, the low compensation rate paid to farmers; and poor biosecurity measures on the affected farms might have contributed to the spread of the disease in Zaria and environs.

Keywords: Highly Pathogenic Avian Influenza, Biosecurity, Zaria

Introduction

Highly pathogenic avian influenza (HPAI) is a devastating disease of poultry; it is associated with a high death rate and disrupts poultry production and trade. It may be transmitted from birds to humans, and is a potential source of future human influenza pandemic (Thanawat *et al.*, 2004; Morris and Jackson, 2005). The reduction in growth rate, egg production and high mortality results in loss of income and livelihoods (Abdu *et al.*, 2005). Production losses due to HPAI subsequently result in high cost of poultry and poultry by-products, because of the resultant scarcity of poultry products and by-products. Countries and regions affected by avian influenza (AI) stand the risk of losing the right to export poultry and poultry by-products to free countries (Abdu *et al.*, 2005). Thus, AI has been described as an international problem that requires international efforts and cooperation to solve (Swayne, 2003).

The outbreak of AI in Nigeria has been the first outbreak of the H5N1 Asian strain on the African continent. The disease was clinically diagnosed initially, at the Veterinary Teaching Hospital, Ahmadu Bello University, Zaria, Nigeria (Adene *et al.*, 2006). The National Veterinary Research Institute (NVRI) laboratory, Vom confirmed the disease to be an AI type A virus infection on February 6, 2006, and the OIE/FAO reference laboratory at Padova, Italy, finally confirmed the disease as HPAI caused by a H5N1 virus (profile: PQGERRRKKRGLFG) on February 7th, 2006 (NADIS INFO, 2006a). From 2003 to date, a total of 228 persons were reported to have died out of 362 persons that were infected with confirmed HPAI H5N1 worldwide (WHO, 2008). One human death due to the disease has been reported in Nigeria in January, 2007 (WHO, 2008). Despite immediate containment measures taken by the veterinary and public health authorities in conformity with standard operation procedures, the disease spread to other parts of the country (NADIS INFO, 2006b).

Materials and Methods

All the AI cases reported to the Avian Clinic of Veterinary Teaching Hospital, Ahmadu Bello University, Zaria, Nigeria from Zaria, within the period of December, 2006 to April, 2007, were reviewed. The cases were diagnosed based on history, clinical signs, and post-mortem findings, and confirmed by rapid antigen detection test

(chromatographic immunoassay) conducted on cloacal swabs using AI type A H5 antigen test kit (manufactured by Symbiotic Corporation, San Diego, USA). All the cases were further referred to the National Veterinary Research Institute (NVRI), Vom, Nigeria, for official confirmation.

Case reports

Case 10226

On the 29th December, 2006, an outbreak of AI was reported in a flock of 10, 000 commercial layers located at Hanwa-Lowcost, Zaria. The birds were in two batches. The older birds were maintained in battery cages while the younger 25-week-old pullets were maintained on deep litter. Four thousand five hundred birds were lost within four days of the onset. The clinical signs were cessation in egg production, high mortality, cyanotic combs and wattles and greenish diarrhea. Farm visit revealed poor biosecurity procedures on the farm. The sale of eggs takes place on the farm (inside the pen). During the outbreak, it was alleged that the sick birds were sold to the public in order to avoid heavy losses. The younger birds were also transferred to another farm at Zango (about 1.5 km away) in order to prevent the spread of the disease. Subsequently, both the younger and the older birds were depopulated by federal authorities.

Case 10276

This case, reported on the 8th January, 2007, involved a commercial hatchery located at Shika, Zaria. The first to be infected was a flock of commercial egg layers consisting of 2, 000 sixty two-week-old layers, maintained on deep litter. The onset was a day prior to clinical presentation during which 15 birds were reported to have died. By mid-day, on the 9th of January, 2007, 450 birds have died. Although, there were no cyanosis of the combs and wattles, the outbreak was characterized by high mortality and a drastic drop in egg production. By the third day of onset the breeders on the farm were also infected. The biosecurity measures taken on the farm were fair. The case was confirmed by rapid antigen detection test (immunochromatography). The entire birds on the farm were subsequently depopulated by federal authorities.

Case 10285

On the 16th January, 2007, an outbreak was reported at a commercial farm in Hanwa-Lowcost area, Zaria, involving 11, 000 twenty three-week-old layers. The onset was the day of clinical presentation during which 11 birds were reported dead. Post-mortem examination conducted on the dead birds showed congested breast muscles, congested viscera, and haemorrhages on the shanks and intestines. The disease was confirmed by rapid

antigen detection test. The outbreak was quickly handled by depopulation by federal authorities.

Case 10287

The case involved a backyard flock of 120, fifty seven-week-old layers in Area A, Samaru, Zaria. It was reported and diagnosed on the 17th January, 2007. Eighteen birds have died since the onset which was 16th January, 2007. The clinical signs were cyanotic combs and wattles, haemorrhages on the shanks and greenish white diarrhea. The birds were subsequently depopulated.

Case 10288

This outbreak occurred on the 4th February, 2007, in a backyard flock of 26 mixed-aged local chickens, in Area A, Samaru, Zaria. History revealed that the owner bought 2 cocks from a live bird market in Samaru, for the purpose of breeding. The outbreak occurred three days after the cocks were introduced to the flock. A total of 9 birds have died within 2 days of the onset, before the remaining birds were subsequently depopulated.

Case 10291

This case presented on 18th January, 2007, involved 200, six-week-old broilers at Samaru, Zaria. They were maintained on deep litter system. The onset was a day prior to clinical presentation. A total of 67 birds have died since the onset. The clinical signs include cyanotic combs, haemorrhages on the shanks, congested viscera and haemorrhages in the intestines. Biosecurity measures were very poor. The birds were also depopulated.

Case 10296

The outbreak occurred on the 18th January, 2007, in a flock of 520, twenty nine-week-old layers at Zango, Zaria. A total of 156 birds have died since the onset which was two days prior to clinical presentation. History revealed that AI outbreak was experienced on the same farm during the previous year. The clinical signs and postmortem lesions observed were similar to those observed in other AI cases diagnosed in the clinic. The birds were depopulated.

Case 10307

This outbreak occurred at Hanwa-Lowcost, Zaria on the 16th February, 2007 in a flock of 550, fifty six-week-old layers. The onset was a day prior to clinical presentation during which thirteen birds have died. Haemorrhages on the shanks and cyanotic comb were the main clinical signs observed. Before the birds were stamped out, it was alleged that some of the sick birds have been sold to the public.

Case 10345

This outbreak occurred on the 27th of April, 2007, in a flock of 14 water fowls comprising 12 geese, 2 mallard ducks and 2 muscovy ducks, in Samaru, Zaria. The onset of the disease was 2 days (25th of April, 2007) after the muscovy ducks were bought from a live bird market and introduced into the flock. Within 2 days of the onset, a total of 9 birds (two muscovy ducks and 7 geese have died). The clinical signs observed were torticolis, cyclic movements, paddling, haemorrhages on the shanks and webs, greenish-yellow diarrhea, prostration and death. The postmortem lesions were mainly congestion of the viscera and haemorrhages in the intestines. Farm visit findings revealed poor biosecurity measures. All the remaining birds were depopulated.

Discussion

The recent outbreaks of AI in Zaria, Nigeria, have highlighted the difficulties in controlling this disease in developing countries. It was observed in this study, that all the AI outbreaks in Zaria occurred within an area of about 15 km radius, between the periods of December, 2006 to March, 2007, which coincided with the cold windy harmattan period. It may be pertinent to say therefore, that the wind velocity and the amount of dust in the air may have influenced the spread and transmission of the disease while the cold stress might have worsened the outcome of the disease (Abdu *et al.*, 1992; Halle *et al.*, 1999). It was also observed that the addition of new birds (without history of health status) into an already existing flock might have been responsible for the outbreaks in cases 10288 and 10345, probably due to lack of knowledge of the implications. The low price compensation being paid to farmers after outbreaks of AI coupled with prolonged delay before payment of compensation have compelled farmers in some places to sell off their sick birds to the public in order to reduce heavy economic losses. By so doing, they are spreading the disease from an infected to an uninfected area or farm. In the commercial and backyard poultry farms, it was observed during farm visits that biosecurity measures were grossly inadequate, either due to ignorance of its importance or carelessness of the farmers. Biosecurity is considered the most important tool to prevent and control AI (De Benedictis *et al.*, 2007). The consequences of these situations are economic losses to the poultry industry, food security issues in developing countries and a serious threat to human health, due to direct consequences of AI infection in humans (De Benedictis *et al.*, 2007; WHO, 2008)

It is recommended that targeted community-based training of backyard and commercial poultry farmers in various aspects of AI recognition and control including biosecurity procedures applicable to small scale and commercial enterprises, and the role of animal disease vigilante in the control of AI should be organized. Adequate compensation rates based on prevailing market prices should be paid to farmers in case of outbreaks, to prevent them from spreading the disease through selling of infected birds to the public.

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