

Newcastle disease (ND) in laying birds in Asaba, Delta State: A Case Report

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ABSTRACT

This is a case report of Newcastle disease in 52 weeks old laying birds with flock size of 2,500 birds and average weight of 1.7kg. The client presented history of continuous deaths and poor laying performance. The clinical signs observed in this case study were mortalities, low egg production, depression, nasal discharge, weakness, and diarrhoea (perineum matted with greenish faeces). Post-mortem investigation revealed haemorrhagic caecal tonsils, enteritis, slightly enlarged and friable liver with areas of discolouration and pin point haemorrhages on pro-ventricular glands. Blood samples were collected from 10 birds and the sera subjected to Haemagglutination and Haemagglutination Inhibition (HI) tests using known NDV (LaSota strain). Low Newcastle disease virus (NDV) antibody titres were detected from the sera samples suggesting that the birds were not protected against ND. The flock was managed by re-vaccination using NDV LaSota strain, followed by administration of a vitamins-mineral supplement, antibiotics, glucose and an analgesic and the treatment yielded favourable therapeutic results. The farmer was advised to apply strict biosecurity measures.

Keywords: Eggs, layers, Newcastle disease, mortality, Nigeria

INTRODUCTION

Newcastle disease virus is an economically important pathogen that affects commercial poultry worldwide (Alexander, 1997), Newcastle disease had been reported in all parts of Nigeria (Baba *et al.*, 1995), and manifests signs of depression, diarrhea, prostration, edema of the head and wattles, poor egg performance of laying birds, nervous signs (such as paralysis and torticollis) and respiratory signs (McFerran and McCracken, 1988). Virulent ND strains may still replicate in vaccinated birds, but the clinical signs would be greatly diminished in relation to antibody levels in affected birds (Allan *et al.*, 1978). Newcastle disease is a highly contagious disease of birds caused by Avian *Paramyxovirus* type 1 affecting chickens, turkeys, geese, ducks, pheasants, partridges, guinea fowl and other wild and captive birds (Dimitrov, 2023). The disease is of high economic importance in poultry world-wide both in commercial and backyard poultry, and prevention is usually by vaccination and biosecurity measures.

CASE HISTORY AND PHYSICAL EXAMINATION

The farmer reported history of continuous death of the birds and that he had a flock of 2,500 layers of Isa brown breed that were 52 weeks of age, he also complained of poor egg laying performance. History also revealed that the birds were fed on commercial feed (Hybrid® Layer Mash) and that they started with mortality rate of 3% (i.e. 75 birds) five days prior to farm visit. The flock was vaccinated when they were 48 weeks old nearly 4 weeks before the visit. They were previously treated with Doxygen® (Doxycycline and Gentamycin) by the farmer, but the situation did not improve. On arrival at his farm in Asaba, Delta State, both distant observations of the farm and close examination of the birds were made and the following observations recorded; water bodies around the farm, wild birds in the farm premises, no foot dip at the entrance of the pens, average body weight of the birds was 1.7kg. The clinical signs were mortalities, low egg production, fever, depression, nasal discharges, weakness, and perineum matted with greenish diarrhoea.

Tentative Diagnosis was Newcastle disease, while Avian influenza and Fowl cholera were listed as Differential Diagnoses.

CONFIRMATION OF DIAGNOSIS

Two (2) mLs of blood sample was taken from the wing vein of each of 10 birds randomly selected from the flock and taken to Poultry and Fish Diseases Diagnosis and Control Laboratory (Division of Animal Care Services Konsult Limited), Asaba, Nigeria for Haemagglutination Inhibition (HI) test to detect antibody levels against ND. The Haemagglutination Inhibition (HI) test was carried out as described by Orajaka *et al.* (1999). Post-mortem investigation was also carried out on a freshly dead bird.

MANAGEMENT

Enrocare 20% BH® (Enrofloxacin 20% and Bromhexine) was administered to the layers at 200 mls to 400 litres of drinking water to prevent secondary bacterial infection in the birds during the course of the disease. Vitaminolyte® (Vitamins, Amino acid, electrolytes and minerals) was administered in drinking water at 1g per 4 liters of drinking water for 5 days and also Glucomol® (Paracetamol and Glucose) at 1g/litre for 4 days. The active birds were vaccinated using NDV (LaSota) while a few very weak ones were culled.

RESULTS AND DISCUSSION

When birds were examined, they showed signs of depression (Fig. I). The post mortem findings revealed areas of haemorrhages on tips of the glands of proventriculus (Fig.III) and haemorrhagic caecal tonsils (Fig. IV). These are highly suggestive of Newcastle disease which agrees with the findings of Vegad (2007); and Dhaygude *et al.* (2017). The results of low NDV antibody-levels by Haemagglutination Inhibition test also suggest Newcastle disease, a contagious disease leading to both mortalities and low egg production. This agrees with the findings of Lera (2021). ND is suspected to have been responsible for both the mortalities and the low egg productivity as revealed by the low HI titres (Table I). Sample numbers 1, 4, 5,9 and 10 had HI titres of only 16 whereas sample numbers 3, 6, 7,8 had titres of 32. Only sample number 2, had titre of 128 (the minimum protective antibody titre against ND- induced egg production losses). Raghul *et al.*, (2006) reported that birds with different HI antibody levels were challenged with virulent NDV, and it was found that HI antibody titre of 128 and above was protective against direct damage of the reproductive tract, while titres 32 to 64 were protective when derived through secondary vaccination only. To prevent mortality against NDV, vaccination should produce titer of at least of 16 and above while to prevent reduction in egg productivity vaccinated hens should have NDV-titers of 128



Figure I. Somnolent and depressed birds (first cell of the 2nd tier cage) in Chickens manifesting low egg-productivity and sporadic deaths in Nigeria



Figure II. Slightly enlarged and friable liver in Chickens manifesting low egg productivity and sporadic deaths in Nigeria



Fig. III. Haemorrhages on tips of periventricular glands in Chickens manifesting low egg-productivity and sporadic deaths in Nigeria



Figure IV. Haemorrhagic Caecal tonsils in Chickens manifesting low egg-productivity and sporadic deaths in Nigeria

Table 1. Haemagglutination Inhibition antibody titers to Newcastle disease virus in Chickens manifesting low egg-productivity and sporadic deaths in Nigeria

| Sample No. | Titre |
|------------|-------|
| 1 | 16 |
| 2 | 128 |
| 3 | 32 |
| 4 | 16 |
| 5 | 16 |
| 6 | 32 |
| 7 | 32 |
| 8 | 32 |
| 9 | 16 |
| 10 | 16 |

and above (Allan and Gough, 1974; OIE, 2004; Alexander *et al.*, 2004) but in this flock most of the hens had lower antibody titers. This clearly explains the reason for the low egg production and the continuous mortalities observed in this flock. Higher HI titres above 1:256 is greatly encouraged to enhance both egg production and prevent mortalities of the birds (Raghul *et al.*, 2006).

There is no treatment for Newcastle Disease, although treatment with Enrocare 20% BH® (Enrofloxacin 20% and Bromhexine), an antibiotic was used to control secondary bacterial infections of respiratory system which might be due to *Mycoplasma gallisepticum* (Siddique *et al.*, 2012). The bromhexine property of the drug was helpful because it's mucolytic. There was great improvement after the antibiotic treatment and the vaccination as the mortality stopped and egg production improved greatly after 7 days of intervention. The improvement is attributed to the fact that the antibiotic must have cleared any secondary bacterial infections complicating the health status of the birds, also the improvement after vaccination could explain a possible earlier vaccination failure or the possibility that the earlier vaccination had waned.

Combination of vaccination (using LaSota strain vaccine), immune booster (vitamins mineral supplements: Vitaminolyte®) may have boosted immunity of the birds against stress as recommended by Sanda *et al.* (2015). Muhammadamin and Qubih (2010), reported that use of immune boosters enhances immune response against ND in immunosuppressed birds. Glucomol® (Paracetamol and Glucose) was administered because the birds were off feed and dull. The Glucomol® administered to the birds may have been responsible for improved activities observed in the birds that were earlier dull and depressed. It may also have reduced pyrexia in the layers.

CONCLUSION AND RECOMMENDATIONS

The birds recovered after treatment with antibiotics with immune booster and subsequent vaccination using ND

LaSota. Proper and adequate vaccination and strict biosecurity were recommended to the farmer. The farmer was particularly advised to get rid of water bodies in the farm vicinity, proper disposal of dead birds and to place a foot mat at the entrance of the pens.

Necessary ethical standards were maintained during sample collection and treatment of the birds as recommended.

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CONFLICT OF INTEREST

The authors declare that there is not conflict of interest regarding publication of this paper.

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