

Outbreak of Infectious Coryza (*Avibacterium Paragallinarum*) in a Backyard Poultry Flock in Uganda-Case Report

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Abstract

In this report, I describe the clinical signs, differential diagnosis, laboratory diagnosis and treatment of infectious coryza introduced in a backyard flock by purchased cocks in Entebbe municipality, Uganda. I further discuss biosecurity measures to prevent introduction and spread of disease in a flock. In January 2022, 150 (30%) chicken from a flock of 500 were infected with Infectious coryza over a period of 10 days. They all showed clinical signs typical of Infectious coryza and other respiratory diseases. A bacteria culture test performed on sheep blood agar developed colonies of *Avibacterium paragallinarum* and was confirmed by Polymerase Chain Reaction. Treatment with amoxicillin-colistin combination was instituted and the response was very good and quick most especially for chicken that were not severely affected. This report identifies biosecurity measures needed to prevent diseases in a backyard flock and avoid economic losses due to infectious coryza. An all in/all out flow of flock is emphasized to avoid reoccurrence of this contagious disease.

Keywords: *Outbreak Of Infectious Coryza; (Avibacterium Paragallinarum; Backyard Poultry Flock*

Introduction

Infectious coryza is an economically important disease of upper respiratory tract of mainly chicken. It is contagious and can be acute or chronic and chronic cases are complicated by other pathogens such as fowl adenovirus (Mei., *et al.* 2020), and *Mycoplasma gallisepticum* (Sarika., *et al.* 2019). This disease is not age specific and causes economic losses due to culling and reduced egg production (Blackall, 1999). Infectious coryza is worldwide and usually come from sick and carrier chicken. It is spread by contaminated feeds, drinking water, direct contact and inhalation of droplets from sick birds. The main symptoms include swelling or edema of infraorbital sinuses with a cheesy exudate, nasal and eye discharges, sneezing and conjunctivitis (Mei., *et al.*, 2020).

Case Report

Case history

The outbreak happened in a flock of 500 duo-purpose chicken in January 2022 in Entebbe municipality, Uganda. All chicken were aged 14 weeks and were kept in one shed. The farmer allowed the chicken to free range during the day and come back to the shed at night. Cocks from another flock in the neighboring village were purchased and introduced into the flock. After 3 days, eye and nasal discharges were observed. Chickens also started sneezing and there was loss of appetite, fever and facial swelling. From the onset of clinical signs to the time proper treatment was instituted, 10 (2%) chicken died and 150 (30%) chicken were infected within a period of 10 days. Biosecurity measures on this farm were insufficient and not followed.

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Investigation/Diagnosis

A veterinarian was invited to the farm, he weighed and physically examined the chicken. The head, neck eyes, mouth, feathers, legs and feet were thoroughly examined. Blood was collected from the brachial vein of the sick chicken for complete blood count and serology during and after treatment. This gave information about progress of treatment and overall health of the birds. Postmortem examination carried out on the dead chicken found that externally, there was swelling of the face (Figure 1) and wattles, on incision of infraorbital sinuses, they had a caseous substance and a lot of mucus, catarrhal inflammation of sinuses and nasal passages observed. swabbing of the infraorbital sinuses was done and five samples were submitted to the laboratory for culture and sensitivity test and confirmation by Polymerase Chain Reaction (PCR). Smears of the exudate from the sinuses were made and gram staining performed. Slides were examined on a microscope to help in quick intervention.



Figure 1: A chicken with Infectious coryza Photo credit: Dr.H. John Barnes.

Differential diagnosis

Differential diagnosis included Mycoplasmosis, *Ornithobacterium rhinotracheale*, Vitamin A deficiency, Avian Pheumovirus, Infectious laryngotracheitis, fowl cholera and infectious bronchitis. Sandoval, Terzolo and Blackall (1994) argue that severity of infectious coryza outbreak is increased by concurrent infections of Pasteurellosis and Mycoplasmosis.

Results

There was leukocytosis at day 3 an indication of active infection and all values were normal at day 10 which showed that the infection had subsided. This helped in assessing the progress of recovery. All five samples (100%) showed colonies of *Avibacterium gallinarum* after culture on sheep blood agar. Sensitivity test showed that they were 100% sensitive to amoxicillin and all five samples were positive for *Avibacterium paragallinarum* by PCR. Gram stain initially done revealed rods with bipolar staining features.

Treatment outcome and disease prevention

All sick chicken were isolated from the flock and taken to a warm and comfortable area. The chicken were treated by gently expressing of the infraorbital sinuses and removing the caseous material and mucus or pus with a warm cloth. An eye ointment containing anti-inflammatory (Neomycin+ Dexamethasone) was applied in both eyes twice daily to treat conjunctivitis. All chicken in the flock were treated with Amoxicillin-640mg/g and colistin sulphate-3200 Mio IU/g powder (AMOXYCOL) that was put in drinking water at a dose of

1g of AMOXYCOL/ 5 litres of drinking water daily for 5 days. Treatment for sick chicken was continued until they fully recovered. Chicken with facial swelling were also given an anti-histamine, Diphenhydramine 2 mg/L.

Although no chicken died during treatment, some chicken were culled during follow up visits because they lost either one or two eyes. All chicken recovered and started feeding well. There was slow growth among the chicken that were severely affected. During treatment, the flock that was not sick was vaccinated with Nobilis Vaccine that has infectious coryza serotypes A, B and C. Four weeks later, a second shot of the vaccine was administered. Out of 150 sick chicken, 30 (20%) were culled because they lost eyes, 120 (80%) recovered and 5 (3%) were stunted although they recovered. The flock lost (died) 10 (2%) chicken out of a total of 500 chicken.

During follow up, blood was collected from vaccinated chicken and submitted to the laboratory for hemagglutination-inhibition test to determine the protective efficacy of the vaccines administered. The immune response was found to be very good.

During follow up visits, the environment around the farm and sheds were sprayed with N-alkyl dimethyl benzyl ammonium chloride and was also administered in drinking water at 50 ppm. Adjustments in infrastructure like constructing footbath at the entrance were made and comprehensive biosecurity plan that included change of clothes and shoes worked out. Farmer and workers were trained on this biosecurity plan implementation. Some areas covered included mortality disposal, disinfection of people, vehicles and equipment, litter management, replacement of chicken and hygiene.

Discussion

Although chicken with Infectious coryza had facial swelling (Fig.1), nasal and eye discharges and open mouth breathing, other respiratory diseases such as mycoplasma, Avian pneumovirus, infectious laryngotracheitis, Infectious bronchitis and chronic fowl cholera may show the same symptoms. A smear of the exudate from the sinus that was gram stained revealed gram negative rods with bipolar staining rods ruling out *Mycoplasma gallisepticum* that is ovoid and pear shaped. The exudate was further cultured and *Avibacterium paragallinarum* colonies developed. Clothier, Torain and Reinl (2019) argue that presence of other similar bacteria such as *Gallibacterium anatis* and *Pasteurella multocida* hinder the accuracy of this test and therefore PCR was performed and all samples from the swabs of the sinuses tested positive for *Avibacterium paragallinarum*.

It is important to note that healthy chicken can be carriers of Infectious Coryza and therefore the cocks which were purchased and introduced into the flock could be the source of the infection. Welchman, *et al.* (2010) observed that Infectious Coryza is multi-age, though mature chicken are believed to be at a higher risk and asymptomatic carriers can transmit this disease to a new flock.

Fauziah, *et al.* (2013) found that amoxicillin had the highest sensitivity (100%) to *Avibacterium paragallinarum* and Jabeen, *et al.* (2013) also noted that amoxicillin had the highest sensitivity to *Pasteurella multocida*, one of the differentials and a common concurrent infection of Infectious Coryza. This informed the decision to use amoxicillin as the drug of choice for managing the sick birds before receiving bacteria culture test and it was corroborated by the sensitivity test.

The chicken had not started laying eggs, the losses incurred were mainly due to culling and stunted growth of some chicken that were severely affected. Akhtar, *et al.* (2001) observed that early diagnosis and treatment of poultry diseases can reduce economic losses.

Biosecurity measures are very critical in the prevention of introduction and spread of infectious coryza in a flock. These measures include ensuring hygiene, limiting visitors and avoiding visiting other farms, keeping other birds out of the poultry houses and avoiding introducing new chicken to the flock, rodent control and avoiding wild birds and inspecting the flock regularly. All infrastructure aspects of biosecurity such as footbath and management aspects outlined above should be seriously considered in poultry farming to prevent

diseases. Alloui, *et al.* (2021) concluded that if biosecurity measures are insufficient, the risk of the flock contracting disease such as infectious coryza is very high. No biosecurity measure was followed by the farmer.

An all in/ all out as an aspect of good biosecurity practices should be considered when designing a poultry farm to prevent diseases including Infectious coryza. This helps to reduce economic losses due contagious diseases like infectious coryza. It is also important to vaccinate the flock early for Infectious coryza.

It was observed that prompt isolation and treatment of sick chicken aid recovery and vaccination of the flock against infectious coryza should be done twice and timely. Vaccination should be done between 5 and 10 weeks. In this case, chicken were 14 weeks and not vaccinated.

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