

Diagnosis of infectious bronchitis in a local chicken

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ABSTRACT: Infectious bronchitis is a disease in chickens caused by avian coronavirus with a single-stranded positive RNA viral genome and belongs to the genus *Gammacoronavirus*. AI is an acute respiratory disease affecting chickens' reproductive systems, kidneys, digestive tract, and defence systems. This article reports that a 13-month-old Sentul Dust layer chicken was found to have a standing posture disorder. Physical examination showed that the chicken had a "Penguin-like" standing posture, its mouth was always open, and it had dyspnoea. The animals were euthanised for necropsy and post-mortem examination. Necropsy showed pathological findings in the form of airsacculitis, splenomegaly, ovarian regression, enteritis, haemorrhage of the tonsillar cavity, and fluid-filled cysts in the oviducts. Chickens are diagnosed with Infectious Bronchitis based on clinical signs and anatomical pathology findings in the organs.

Keywords:

local chicken, infectious bronchitis, oviductal cyst

■ INTRODUCTION

Infectious Bronchitis (IB) is a chicken disease caused by the Avian coronavirus. Avian coronavirus is a single-stranded positive RNA virus classified in the genus *Gammacoronavirus* (Bo *et al.* 2022). IB is an acute and highly contagious respiratory disease in chickens. The IB virus also attacks chickens' reproductive system, kidneys, digestive tract and defence system (Abdel-Moneim 2017). This disease has a morbidity of up to 100%, with a mortality rate that can reach 20% depending on age, immune status of the bird, virus strain, and the presence of secondary infections (Swayne 2020). Due to its easy mutation, the IB virus has seven genotypes and approximately 100 serotypes (Pudjiatmoko *et al.* 2014). The local strains of the IB virus in Indonesia are the IB I.37 variant from Conn and the IB PTS-3 variant from N2/62 (Dharmayanti & Indriani 2017).

Layer hens infected with the IB virus can show symptoms of a decrease in egg production of up to 70% and a decrease in eggshell quality. The eggs become pale, and the albumin becomes watery. Egg production can improve but can also be permanent depending on the individual's immune system (Swayne 2020). Prevention is the only way that can be done in chickens through a vaccination program. The IB vaccines in Indonesia are IB serotypes M41, H120, and Conn (Dharmayanti & Indriani 2017). ELISA is used to diagnose living chickens (Rahmahani *et al.* 2022). This paper reports the diagnosis of IB in a local chicken, the Sentul Debu chicken, through anatomical pathology examination.

■ CASES

Signalement: A 13-month-old Sentul Dust layer chicken at a chicken farm belonging to the Jatiwangi Poultry Breeding Development Center (BPPTU). Chickens are raised using intensive methods in colony cages. One cage contains one male and four females. **Anamnesis:** Chickens were found to have standing posture abnormalities on June 7 2023. Chickens are kept in colony cages, so individual egg production is unknown. Chickens have been given vaccines for IB, Marek's Disease, Newcastle Disease, Infectious Bursal Disease, Infectious Coryza, Avian Influenza, Swollen Head Syndrome, and Egg Drop Syndrome. The IB vaccine given to chickens is the IB Live vaccine at Day Old Chick, ten weeks before entering the layer phase, and the IB Killed vaccine at 19 weeks. **Physical examination:** The chicken has a "Penguin-like" standing posture (Figure 1), the mouth is always open, and there is dyspnea.



Figure 1. The standing posture of the Sentul Debu Chicken is "Penguin-like"

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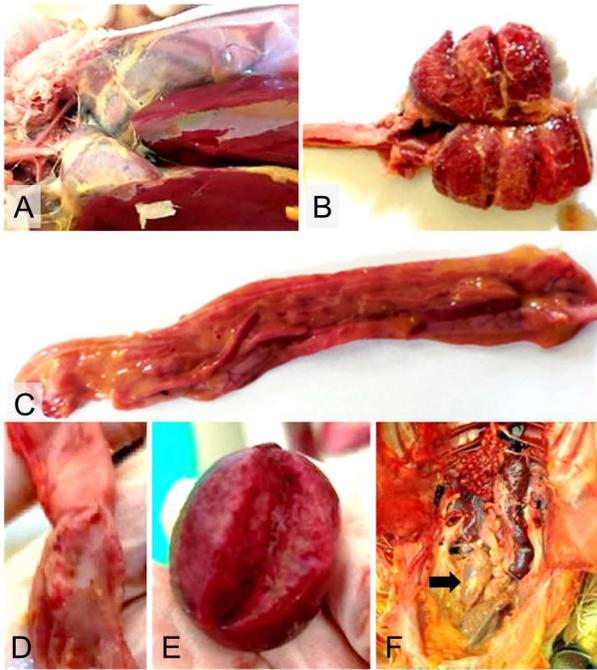


Figure 2. Pathological findings in Sentul Debu chickens include (A) airsacculitis, (B) pulmonary congestion, (C) enteritis, (D) tonsillar hemorrhage, (E) splenomegaly, and (F) ovarian regression with a cyst in the left oviduct containing an accumulation of serous fluid (black arrow).

Further examination: The animal was then euthanized for necropsy and postmortem examination to observe any anatomical pathology findings at the BPPTU Jatiwangi Veterinary Laboratory. Diagnosis: Infectious Bronchitis (IB).

RESULTS AND DISCUSSION

Necropsy results showed anatomical pathology findings in the form of airsacculitis (Figure 2A), pulmonary congestion (Figure 2B), enteritis (Figure 2C), haemorrhage of the tonsillar cae (Figure 2D), splenomegaly (Figure 2E), ovarian regression, and there were fluid-filled cyst in the oviduct (Figure 2F). The parasitic worm was found, suspected of being *Railietina* sp. in the jejunum and *Heterakis* sp. on the cecum.

Cloudiness of the air sacs (airsacculitis) or inflammation of the air sacs changes the colour of the air sacs to become cloudy and yellowish due to thickening and accumulation of exudate, which can come from viruses, bacteria, protozoa and fungi (Hernández 2014). Pulmonary congestion can occur due to viral or bacterial infections (Yehia *et al.* 2023). Chickens infected with IB Virus can show anatomical pathology in the form of airsacculitis (Pudjiatmoko *et al.* 2014) and pulmonary congestion (Bo *et al.* 2022).

The lymphoid system had an enlarged spleen (splenomegaly) and haemorrhage in the tonsillar sheath (Figure 2E). The IB virus can infect various immune organs, such as the tonsils, spleen, Harderian gland and bursa of Fabricius (Najimudeen *et al.* 2020). Splenomegaly indicates a pathogenic infection in the chicken. As a lymphoid system, the spleen performs increased work in fighting antigens and producing antibodies, as well as increasing the number of reticuloendothelial cells in the spleen. This increase in immune function can

cause splenic hyperplasia (Chapman *et al.* 2022). Other lesions encountered at necropsy were ovarian regression and the formation of fluid-filled cysts in the oviducts (Figure 4). This cyst can be found in infection with the QX variant IB Virus, which infects the reproductive tract and forms cysts filled with clear serous fluid in the oviducts (Mueller *et al.* 2022). Accumulation of serous fluid is the cause of chicken posture symptoms penguins-like (Pudjiatmoko *et al.* 2014).

CONCLUSION

Sentul Debu layer chickens were found with symptoms of dyspnea and penguin-like posture. Necropsy results showed pathological findings in the form of airsacculitis, splenomegaly, ovarian regression, enteritis, haemorrhage of the tonsillar cae, and fluid-filled cysts in the oviducts. Chickens are diagnosed as infected with Infectious Bronchitis based on clinical signs and anatomical pathology found. Further testing in the form of PCR is needed to confirm the type and variant of the infecting virus.

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