108450

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Signalment and History

- 5.6 week old broiler chickens
- Recombinant vaccine given in-ovo
- Vaccinated with CEO vaccine at 10 days
- Very high mortality

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Necropsy gross lesions

- Thoracic airsacculitis that also extended to lung
Differential diagnoses: tracheitis and airsacculitis

- **Viral**: Infectious Bronchitis, Newcastle disease virus, Avian Influenza, Laryngotracheitis

- **Bacterial**: *E. coli*, *Pasteurella multocida*, *Ornithobacterium rhinotracheale*, *Mycoplasma gallisepticum*, *Mycoplasma synoviae*, *Hemophilus paragallinarum*

- **Fungal**: *Aspergillus* spp.
Normal tracheal epithelium and Lung

Mild LP infiltrate is relatively normal for broilers due to environmental conditions of poultry house.
Trachea
Lung: Fibrinoheterophilic bronchopneumonia

Heterophils, fibrin necrotic cellular debris

Severe edema

Necrosis and ulceration
Primary bronchial epithelium: Syncytial cells with viral inclusions
Bronchial epithelium
Morphologic Diagnosis

- **Trachea**: Moderate, diffuse necroulcerative, lymphoplasmacytic tracheitis with deciliation, syncytial cell formation and intranuclear inclusions

- **Lung**: Moderate, multifocal lymphoplasmacytic fibrinoheterophilic bronchopneumonia with syncytial cells and intranuclear inclusions
Final Diagnosis

- **Infectious Laryngotracheitis**

- Confirmed with Virus isolation (trachea and lung)
Infectious Laryngotracheitis

- Etiology: Gallid herpes virus-1
- Double stranded DNA molecule
Epizootology

Transmission:
- **Horizontal**: respiratory, oral, intraocular (exposure of nasal epithelium through ingestion)
- **Fomites and contamination**
- **Wind**: live haul of birds to processing plant
- **Backyard poultry**
- **Susceptible birds**: Chicken, pheasants and peafowl
Latency and Recrudescence

- Virus can become latent in Trigeminal nerve and recrudesce when birds become stressed or immunosuppressed
- Shedding and infection of naïve birds
- “Vaccinal outbreaks”
- Has been linked to CEO vaccines with multilocus PCR-RFLP analyses and nucleotide sequence analysis

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Pathogenicity

- Clinical disease ranges from
- **Mild:**
  - Mucoid tracheitis, conjunctivitis (more commonly seen in diagnostic lab), low to moderate morbidity and minimal mortality, poor weight gain, decreased egg production

  **To**

- **Severe:** expectoration of blood stained mucus, severe conjunctivitis
  Moderate to high morbidity and mortality

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Pathogenesis

- Spread via aerosolized respiratory secretions → virus enters URT and conjunctiva → may spread from cell to cell with no detectable viremia →

Acute phase (1-4 days PI)
Recovered birds become inapparent carriers and harbor virus in respiratory tract (Endemic condition in flock)

Latency in trigeminal nerve ganglion, reactivation with stress and immunosuppression

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Viral Replication: GaHV1 attachment to host cell → fusion of envelope with host cell plasma membrane → nucleocapsid released into cytoplasm → viral DNA enters through nuclear pores → transcription and replication → DNA cleaved into unit lengths and encapsulated into nucleocapsids → envelope acquired through migration of inner lamella of nuclear membrane → migrate through ER, accumulate in vacuoles in cytoplasm → virions released by cell lysis or vacuolar membrane fusion and exocytosis
Clinical signs

- Conjunctivitis
- Dyspnea
- Rales
- Expulsion of hemorrhagic tracheal casts
- Drop in egg production

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Gross lesions

Figure 2 – Larynx and trachea of a 45-week-old chicken naturally infected with GaHV-1. The mucosa is hyperemic and fibrinous exudate covers part of mucosa, characterizing gross ILT lesions.

http://www.scielo.br/img/revistas/rbca/v16n4/04f02.jpg
Diagnosis:

- Histopathology (rapid diagnostic method, 1 day results, characteristic lesions may only be present 1-5 days PI)
- Virus isolation (Gold standard, may take up to 2 weeks)
- Fluorescent antibody tests (most rapid)
- PCR
Laryngotracheitis with Lung involvement

- Rarely affects lung and airsac

- Vaccination with spray vaccines of inappropriate particle size (Too small)

- More virulent strain of virus / Increased virulence with passage through flock
References

Thank you