Agri Articles
(e-Magazine for Agricultural Articles)
Volume: 06, Issue: 01 (JAN-FEB, 2026)
Available online at http://www.agriarticles.com
©Agri Articles, ISSN: 2582-9882

Chronic Respiratory Disease (CRD) in Birds: A Review

*Dr. Bharat Jangid and Dr. Sarjna Meena
Post Graduate Institute of Veterinary Education and Research, Jaipur, Rajasthan
University of Veterinary and Animal Sciences, Jobner, Jaipur, Rajasthan, India
*Corresponding Author's email: thebharatjangid@gmail.com

Chronic Respiratory Disease (CRD) is one of the most persistent and economically significant health problems in poultry worldwide. Primarily it caused by *Mycoplasma gallisepticum*, severity increased due to secondary infections such as *Escherichia coli*, Newcastle disease virus and infectious bronchitis virus, it leads to complex chronic respiratory disease (CCRD). The condition is characterized by coughing, nasal discharge, sinus swelling, conjunctivitis and reduced productivity, with gross lesions consisting air sacculitis and tracheitis. Disease diagnosis based on a combination of clinical signs, pathological lesions and laboratory methods eg: PCR, ELISA and culture. CRD leads to severe economic losses through decreased growth rates, poor feed conversion, reduced egg production and increased mortality. Control strategies emphasize biosecurity, vaccination and judicious use of antimicrobials, though eradication is challenging due to *Mycoplasma gallisepticum*'s persistence and vertical transmission. Advances in molecular diagnostics, vaccine development and emerging technologies such as artificial intelligence for outbreak prediction offer promising avenues for improved management. This review enhances current knowledge on etiology, epidemiology, pathogenesis, clinical features, diagnosis, economic impact and control measures of CRD, highlighting future perspectives for sustainable poultry health and production.

Introduction

Chronic Respiratory Disease (CRD) is one of the most significant health challenges in poultry worldwide. It primarily affects chickens and turkeys, though other avian species are also susceptible. The disease is caused by *Mycoplasma gallisepticum*, a bacterium with no cell wall, which makes it resistant to many common antibiotics. CRD is economically important because it reduces productivity, increases mortality and predisposes birds to secondary infections.

Etiology

Primarily caused by- ***Mycoplasma gallisepticum***
Secondary causative agents: *Escherichia coli*, *Newcastle disease virus*, *Infectious bronchitis virus* often complicate CRD, leading to **"Complex Chronic Respiratory Disease" (CCRD).**
It spreads through:
Vertical transmission (via eggs).
Horizontal transmission (via aerosols, direct contact, contaminated equipment).

Epidemiology

CRD is **globally distributed**, with higher prevalence in intensive poultry systems. Predisposing factors such as overcrowding, poor ventilation, and nutritional deficiencies increase susceptibility. Outbreaks of the CRD are common in both commercial and backyard flocks.

Pathogenesis

Mycoplasma gallisepticum colonizes the respiratory tract epithelium. It causes Cilio stasis, impairing mucociliary clearance. This leads to inflammation, mucus accumulation, and susceptibility to secondary bacterial infections.

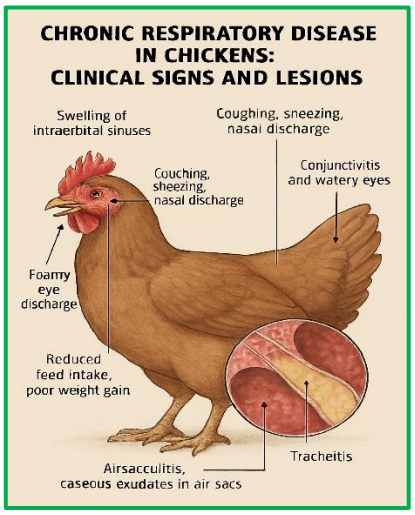

Fig- CRD clinical signs and lesions

Clinical Signs

Coughing, sneezing, nasal discharge, Swelling of infraorbital sinuses, Conjunctivitis and watery eyes, Reduced feed intake, poor weight gain, drop in egg production.

In turkeys: foamy eye discharge is characteristic.

Gross and Microscopic Lesions

Gross Lesions: Air sacculitis, caseous exudates in air sacs, tracheitis, sinusitis.

Microscopic Lesions: Hyperplasia of respiratory epithelium, infiltration of lymphocytes and macrophages, thickened air sac membranes.

Diagnosis

Clinical signs and lesions- provide initial suspicion.

Laboratory tests- Culture of *Mycoplasma gallisepticum* (difficult and time-consuming), PCR (highly sensitive and specific), ELISA and HI tests (serology).

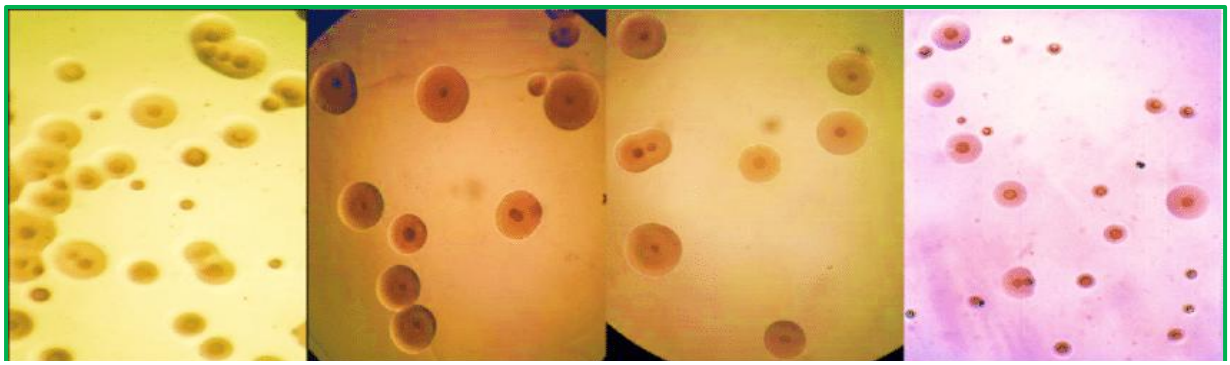

Fig- Microscopical appearance of M. gallisepticum with characteristic fried egg appearance with depressed center colonies.

Differential diagnosis- includes Newcastle disease, infectious bronchitis, and colibacillosis.

Economic Impact

Reduced growth rate and feed conversion efficiency, Drop in egg production and hatchability, Increased mortality in severe outbreaks, Higher costs due to medication and preventive measures.

Control and Prevention

Biosecurity- Prevent introduction of *Mycoplasma gallisepticum* into flocks.

Vaccination- Live attenuated and inactivated *Mycoplasma gallisepticum* vaccines are available.

Management- Good ventilation, reduced stress, balanced nutrition.

Medication- Antimicrobials such as Tylosin, doxycycline, enrofloxacin can reduce severity but do not completely eliminate *Mycoplasma gallisepticum*.

Future Perspectives

Molecular diagnostics- PCR and sequencing for Rapid detection.

AI and machine learning- Emerging tools for early outbreak prediction and monitoring.

Genetic resistance- Breeding programs may also help in developing *Mycoplasma gallisepticum* -resistant poultry lines.

One Health approach- Integrating veterinary, environmental, and technological strategies.

Conclusion

CRD remains a persistent challenge in poultry farming. While vaccines and antibiotics help to reduce its severity, but complete eradication is difficult due to *Mycoplasma gallisepticum*'s ability to persist in flocks. A combination of biosecurity, enhanced diagnostic approaches and innovative technologies such as AI-based monitoring may provide sustainable results.

References

1. Ley, D.H. (2008). *Mycoplasma gallisepticum* infection. *Poultry Diseases*, 6th ed.
2. Kleven, S.H. (2003). Mycoplasma infections in poultry. *Rev Sci Tech*, 19(2): 425–442.
3. Govindhasamy, S. et al. (2023). Pathological and molecular investigation of CCRD. *Indian J Vet Pathol*, 47(2): 169–172.
4. Bharathi, I. et al. (2022). Management of CRD outbreak in native chicken farm. *Pharma Innovation Journal*, 11(12): 2166–2167.
5. Yoder, H.W. (1991). *Mycoplasma gallisepticum* infections. *Disease of Poultry*, 9th ed.
6. Stipkovits, L., & Kempf, I. (1996). Mycoplasmoses in poultry. *World's Poultry Science Journal*, 52: 29–35.
7. Jordan, F.T.W. (1996). Avian mycoplasma infections. *Vet Q*, 18(3): 104–111.
8. Ravikumar, R. et al. (2019). Patho-epidemiological study of CRD in poultry.
9. Ferguson-Noel, N. (2010). Control of MG infections in poultry. *Avian Pathology*, 39(5): 365–377.
10. Dhama, K. et al. (2014). Poultry health and production: Mycoplasma infections. *Vet Med Int*, 2014: 1–10.
11. Bradbury, J.M. (2005). Avian mycoplasmas. *Avian Pathology*, 34(6): 447–458.
12. OIE (2021). Manual of Diagnostic Tests and Vaccines for Terrestrial Animals.
13. Nascimento, E.R. et al. (2005). *Mycoplasma gallisepticum* control in poultry. *Brazilian J Poultry Sci*, 7(1): 1–9.
14. Ewing, M.L. et al. (1996). PCR detection of MG. *Avian Diseases*, 40(3): 481–485.
15. Garcia, M. et al. (2005). Molecular characterization of MG strains. *Avian Pathology*, 34(1): 1–8.
16. Bencina, D. (2002). Molecular basis of MG pathogenicity. *Vet Res*, 33(4): 455–464.
17. Evans, J.D., & Leigh, S.A. (2008). Vaccination against MG. *Avian Diseases*, 52(4): 563–570.
18. Whithear, K.G. (1996). Control of MG with vaccines. *Avian Pathology*, 25(4): 543–556.
19. Charlton, B.R. (2000). Avian Disease Manual. *American Association of Avian Pathologists*.
20. Dhama, K. et al. (2020). Advances in diagnosis and control of avian mycoplasmosis. *Poultry Science Journal*, 8(2): 89–102.
21. El-Sawah, A. M., & El-Mahdy, S. S. (2021). Mycoplasma gallisepticum: A devastating organism for the poultry industry in Egypt. Poultry Science, 101(5), 101658.