CHLAMYDIOSIS IN EXOTIC BIRDS: A HIDDEN ZOONOTIC THREAT AND THE ONE HEALTH PERSPECTIVE

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Abstract

Chlamydiosis, also known as psittacosis or avian chlamydiosis, is an important zoonotic disease affecting a wide range of exotic pet birds. The disease is caused by *Chlamydia psittaci*, an obligate intracellular bacterium capable of infecting humans and numerous animal species. With the increasing popularity of exotic birds as companion animals, awareness regarding chlamydiosis has become essential for veterinarians, bird owners, public health professionals, and policymakers. The disease poses a significant threat to both avian and human health due to its zoonotic nature and the ability of infected birds to remain asymptomatic carriers. This article discusses the epidemiology, transmission, clinical manifestations, diagnosis, treatment, prevention, and One Health significance of chlamydiosis in exotic birds.

Keywords: Chlamydiosis, Psittacosis, Exotic Birds, Zoonosis, One Health, *Chlamydia psittaci*

Introduction

Exotic birds such as parrots, cockatiels, budgerigars, macaws, lovebirds, cockatoos, and African grey parrots have become increasingly popular companion animals worldwide. Their intelligence, vibrant appearance, and social behaviour make them attractive pets for bird enthusiasts. However, these birds can harbour several infectious diseases of public health importance. Among these diseases, avian chlamydiosis is considered one of the most significant zoonotic infections associated with pet birds.

The disease is caused by *Chlamydia psittaci*, a bacterial pathogen that primarily infects psittacine birds but has also been reported in pigeons, doves, waterfowl, and numerous wild bird species (Swayne *et al*., 2020). Human infection, commonly known as psittacosis or parrot fever, occurs through exposure to infected birds or contaminated environments. The close interaction between humans and companion birds highlights the importance of integrated surveillance, early diagnosis, and preventive strategies under the One Health framework.

Etiology

Chlamydia psittaci is a Gram-negative, obligate intracellular bacterium belonging to the family Chlamydiaceae. The organism possesses a unique biphasic developmental cycle consisting of infectious elementary bodies and metabolically active reticulate bodies. Elementary bodies are responsible for transmission and infection, whereas reticulate bodies multiply within host cells before transforming back into infectious forms (Sachse *et al*., 2015).

Several genotypes of C. psittaci have been identified, and some genotypes exhibit host preferences for particular avian species. Nevertheless, cross-species transmission occurs frequently and contributes significantly to the epidemiology and persistence of the disease in avian populations.

Epidemiology

Avian chlamydiosis has a worldwide distribution and has been reported in more than 450 species of birds. Psittacine birds are recognized as the most important reservoirs of infection. The prevalence of the disease is particularly high in aviaries, breeding facilities, pet shops, wildlife rehabilitation centres, bird exhibitions, and rescue units where birds are housed in close proximity.

Stress plays a crucial role in disease expression and bacterial shedding. Factors such as transportation,

overcrowding, breeding activities, poor nutrition, environmental changes, and concurrent illnesses can activate latent infections and increase the shedding of the organism into the environment (Doneley *et al*., 2016). Consequently, apparently healthy birds may serve as important sources of infection for other birds and humans.

Disease	Causative Agent	Susceptible Host
Psittacosis or Ornithosis	*Chlamydia psittaci*	Psittacine birds
Chlamydial polyarthritis	*Chlamydia psittaci*	Calves, lambs, foals
Chlamydial abortion	*Chlamydia psittaci*	Ewes, goat
Ovine contagious ophthalmia (pink eye)	*Chlamydia psittaci*	Sheep
Sporadic bovine encephalomyelitis or Buss disease or Transmissible serositis	*Chlamydia pecorum*	Calves, cattle, buffalo
Sexually transmitted infections, Trachoma and Respiratory infections	*Chlamydia trachomatis, C. pneumoniae, C. psittaci*	Humans

Table 1: Shows diseases caused by Chlamydia in different species.

Transmission

Transmission of *C. psittaci* occurs primarily through inhalation of aerosolized particles originating from dried faeces, feather dust, respiratory secretions, and contaminated cage materials. The organism can survive in dried organic matter for extended periods, facilitating environmental transmission.

Many infected birds remain asymptomatic carriers and intermittently shed the bacterium without displaying clinical signs. This carrier state contributes significantly to disease persistence and spreads. Human infection generally occurs through inhalation of contaminated aerosols generated during cage cleaning, handling infected birds, or exposure to contaminated aviary environments (Centres for Disease Control and Prevention, 2024). Direct transmission between birds may occur through respiratory, oral, and faecal routes.

Clinical Signs in Exotic Birds

The clinical presentation of avian chlamydiosis varies considerably depending on the species, age, immune status of the bird, and virulence of the infecting strain. Infected birds may exhibit nonspecific signs that often resemble other avian diseases.

Affected birds commonly show depression, lethargy, anorexia, progressive weight loss, ruffled feathers, conjunctivitis, nasal discharge, respiratory distress, and greenish diarrhoea. A reduction in activity, vocalization, and overall responsiveness may also be observed. In severe cases, sudden death can occur without preceding clinical signs. Importantly, some infected birds remain clinically normal while continuously shedding the organism, making diagnosis and disease control particularly challenging (Swayne *et al*., 2020).

Fig 1: Conjunctivitis

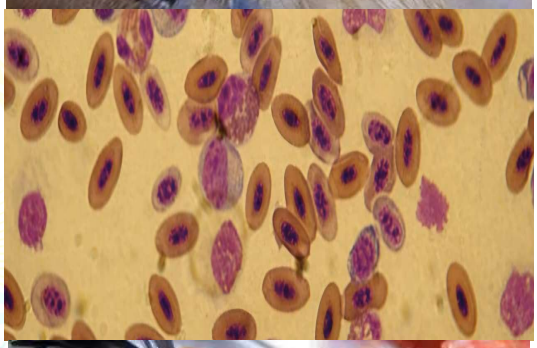

Fig 2: Leucocytosis

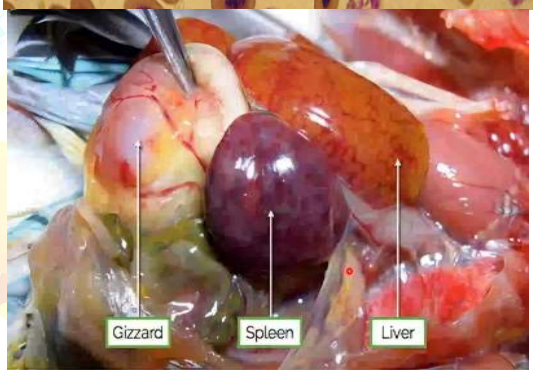

Fig 3: Inflammation of organs

Zoonotic Significance

Avian chlamydiosis is regarded as one of the most important zoonotic diseases associated with companion birds. Human infection, known as psittacosis, can vary from a mild influenza-like illness to severe atypical pneumonia requiring hospitalization. Affected individuals commonly present with fever, chills, headache, myalgia, fatigue, and a persistent dry cough. In more severe cases, pneumonia and respiratory

distress may develop. Rare complications involving the cardiovascular and nervous systems have also been reported.

Certain occupational groups are at greater risk of infection. These include veterinarians, veterinary students, bird breeders, pet shop workers, wildlife rehabilitators, laboratory personnel, poultry workers, and bird owners who have frequent contact with birds or contaminated environments (Balsamo *et al*., 2017).

Diagnosis

Accurate diagnosis of avian chlamydiosis requires a combination of clinical evaluation, history, and laboratory testing. Molecular diagnostic methods have significantly improved the detection and confirmation of infection.

Polymerase Chain Reaction (PCR) and Real-Time PCR assays are currently considered the most reliable diagnostic techniques because of their high sensitivity and specificity. Additional diagnostic approaches include enzyme-linked immunosorbent assays, complement fixation tests, indirect fluorescent antibody tests, and cytological examination of clinical samples. Laboratory confirmation is essential because clinical signs are often nonspecific and may resemble those of several other avian diseases (Sachse *et al*., 2015).

Treatment

Bacteriostatic drugs, doxycycline remains the treatment of choice for avian chlamydiosis @ 75-100mg/kg IM q5 to 7 days, IV formulation for human use (doxycycline hyclate) can be given IV in birds, but significant muscle necrosis occurs when given IM, Oral route @ 25 to 50mg/kg PO SID, drinking water @ 400mg in 1liter of water, for budgerigars @ 300mg/kg seeds (treatment in drinking water is not effective), in severe case start with injectable formulations and continue with oral formulations and is widely recommended because of its effectiveness against intracellular bacteria. Treatment generally continues for 30 to 45 days to ensure complete elimination of the organism and to prevent relapse.

Fluoroquinolones are good *in vitro* activity, but activity *in vivo* is not as good. It eliminates the clinical signs but not the infection. Dose rate of enrofloxacin @ 20mg/kg PO or IM q12hr. Other treatments such as oxytetracycline @ 75 to 100mg/kg IM q3 days produces muscle necrosis and should not be given more than once, Azithromycin @ 40mg/kg PO q48hr for 21days

Supportive care is equally important and may include nebulization (in cases of air sacculitis or pneumonia), hepatic protectants when liver is involved, fluid therapy, nutritional supplementation, environmental management, and stress reduction. Birds receiving treatment should be isolated from healthy individuals and closely monitored by veterinarians throughout the treatment period. Proper adherence to treatment protocols is essential for successful disease control.

Prevention and Control

Prevention of avian chlamydiosis relies on a combination of biosecurity measures, routine health monitoring, and public awareness. Newly acquired birds should be quarantined before introduction into existing collections. Regular veterinary examinations and health screening programs can facilitate early detection of infection.

Proper sanitation of cages, aviaries, feeding equipment, and surrounding environments is critical for reducing pathogen transmission. Bird handlers should use appropriate personal protective equipment when cleaning cages or handling suspected cases. Adequate ventilation in bird housing facilities further reduces the risk of aerosol transmission.

Bird owners should be educated regarding zoonotic risks and encouraged to practice proper hand hygiene after handling birds. Avoiding exposure to feather dust and dried droppings is particularly important in preventing human infection.

Public Health Significance

Chlamydiosis remains an underdiagnosed zoonosis because clinical signs mimic influenza and atypical pneumonia. Human outbreaks continue to occur among poultry workers, bird owners, and veterinarians. A 2025 meta-analysis estimated that in documented outbreaks, approximately 27.7% of exposed individuals developed psittacosis; among cases, hospitalization occurred in about 42.3%, pneumonia in **59.7%**, and the overall fatality rate was **1.8%** (Sheng Y *et al*., 2025)

One Health Perspective

Avian chlamydiosis serves as an excellent example of the interconnected relationship between animal health, human health, and environmental health. The disease illustrates how pathogens circulating within

wildlife and companion animal populations can directly affect human populations.

Effective prevention and control require collaboration among veterinarians, physicians, microbiologists, wildlife experts, epidemiologists, public health authorities, and bird owners. Surveillance programs, responsible pet ownership, biosecurity measures, disease reporting systems, and public education initiatives are essential components of a comprehensive One Health strategy.

Strengthening interdisciplinary cooperation can improve disease detection, reduce zoonotic transmission, and enhance preparedness for emerging infectious diseases originating from animal reservoirs.

Conclusion

Chlamydiosis in exotic birds remains an underrecognized yet significant zoonotic disease with important implications for animal and public health. The increasing popularity of exotic pet birds has created greater opportunities for pathogen transmission between birds and humans. Because infected birds may remain asymptomatic carriers, early diagnosis and routine health monitoring are essential for effective disease management. Appropriate treatment, strict biosecurity measures, and increased public awareness play crucial roles in disease prevention and control. Adopting a One Health approach will strengthen collaboration among animal health, human health, and environmental sectors, ultimately safeguarding both avian welfare and public health against this important zoonotic pathogen.

Key Points

- Chlamydiosis is caused by obligate intracellular bacteria of the family Chlamydiaceae.
- *Chlamydia psittaci* is the principal zoonotic species causing avian chlamydiosis and human psittacosis.
- *Chlamydia abortus* is an important cause of abortion in sheep and goats and poses a significant risk to pregnant women.
- Infection is primarily transmitted through inhalation of contaminated aerosols from bird secretions, faeces, or feather dust.
- The organism has a biphasic life cycle consisting of infectious elementary bodies and replicative reticulate bodies.
- PCR is the diagnostic method of choice.
- Doxycycline is the treatment of choice for both birds and humans.
- Control relies on a One Health approach integrating animal, human, and environmental health.

References

Balsamo, G., Maxted, A. M., Midla, J. W., Murphy, J. M., Wohrle, R., Edling, T. M., & Tully Jr, T. N. (2017). Compendium of measures to control *Chlamydia psittaci* infection among humans (psittacosis) and pet birds (avian chlamydiosis). *Journal of avian medicine and surgery*, *31*(3), 262-282. Centers for Disease Control and Prevention (CDC). Psittacosis (Parrot Fever). Atlanta: CDC; 2024.

Doneley B, Monks D, Johnson R & Carmel B. (2016) Avian Medicine and Surgery in Practice: Companion and Aviary Birds. 2nd ed. Boca Raton: CRC Press.

Harkinezhad, T., Geens, T., & Vanrompay, D. (2009). Chlamydophila psittaci infections in birds: a review with emphasis on zoonotic consequences. *Veterinary microbiology*, *135*(1-2), 68-77.

Kaleta EF, Taday EM. (2003) Avian host range of Chlamydophila spp. based on isolation, antigen detection and serology. *Avian Pathology*, *32*(5), 435–461.

Sachse K, Laroucau K, Vorimore F, Magnino S, Feige J & Müller W (2015). Recent developments in the laboratory diagnosis of chlamydial infections. *Veterinary Microbiology*, *179*(1–2), 15–24.

Sheng Y, Jin LY, Li N, Zhang Y & Shi YJ. Global prevalence of psittacosis in outbreaks: a systematic review and meta-analysis. BMC Public Health. 2025 May 31;*25*(1):2010.

Swayne DE, Boulianne M, Logue CM, McDougald LR, Nair V & Suarez DL. (2020) Diseases of Poultry. 15th ed. Hoboken: Wiley-Blackwell.

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