

Infectious Coryza

Definition:

Infectious coryza (IC) is an acute upper respiratory disease of chickens caused by *Haemophilus paragallinarum* that characterized by nasal discharge, bilateral or unilateral sinusitis and facial edema. The disease has a great economical impact as it results in poor growth performance with increased culls rate in broiler chicks and marked reduction in egg production (10-40%).

Etiology:

1. The causative agent of IC was classified as *H. paragallinarum* because of its requirement for both X-(hemin) and V-(nicotinamide adenine dinucleotide—NAD) factors for growth in or on artificial media.
2. Tryptose blood agar, Brain heart infusion and chicken-meat infusion are some basal media recommended for isolation.
3. Sodium chloride (NaCl) (1.0—1.5%) is essential for growth. Chicken serum (1%) is required by some strains.
4. The organism is commonly grown in an atmosphere of 5% carbon dioxide; however, carbon dioxide is not an essential requirement, because the organism is able to grow under reduced oxygen tension or anaerobically.
5. *H. paragallinarum* is a gram-negative non-motile bacterium. In 24-hour cultures, it appears as short rods or coccobacilli with a tendency for filament formation.
6. A capsule may be demonstrated in virulent strains.
7. The organism undergoes degeneration within 48—60 hours, showing fragments and ill-defined forms. Subcultures to fresh medium at this stage will again yield the typical rod-shaped morphology. Bacilli may occur singly, in pairs, or as short chains.
8. Tiny dewdrop, non-hemolytic colonies up to 0.3 mm in, mucoid (smooth) iridescent, rough non-iridescent.
9. *H. paragallinarum* is a delicate organism that is inactivated rather rapidly outside the host. Infectious exudate suspended in tap water is inactivated in 4 hours at ambient temperature; when suspended in saline, the exudate is infectious for at least 24 hours at 22°C. Exudate or tissue remains infectious when held at 37°C for 24 hours and, on occasion, up to 48 hours; at 4°C, exudate remains infectious for several days. At temperatures of 45—55°C, hemophili are killed within 2—10 minutes.
10. The organism is classified with the plate agglutination test using whole cells and chicken antisera into serovars A, B, and C.

Natural and Experimental Hosts:

The chicken is the natural host for *H. paragallinarum*. All ages are susceptible, but the disease is usually less severe in younger birds.

Transmission:

Chronic or healthy carrier birds have long been recognized as the main reservoir of infection. Infectious coryza seems to occur most frequently in fall and winter, although

such seasonal patterns may be coincidental to management practices. Infectious coryza is not an egg-transmitted disease.

Incubation period:

Infectious coryza is characterized with short incubation that clinical signs develop within 24-48 hours. Susceptible birds exposed by contact to infected cases may show signs of the disease within 24-72 hours. In the absence of a concurrent infection, IC usually runs its course within 2-3 weeks.

Clinical signs:

1. The most prominent features are an acute inflammation of the upper respiratory tract including nasal passage and sinuses with a serous to mucoid nasal discharge, facial edema, and conjunctivitis.
2. Swollen wattles may be evident, particularly in males, while rales may be heard in birds with infection of the lower respiratory tract.
3. A swollen head-like syndrome associated with *H. paragallinarum* has been reported in broilers in the absence of avian pneumovirus.
4. The disease may be complicated with other bacterial pathogens such as *M. synoviae* and *M. gallisepticum*.
5. Feed and water consumption usually is decreased; in growing birds, this means an increased number of culls; and in laying flocks, this means a reduction in egg production (10-40%).
6. A foul odor may be detected in flocks in which the disease has become chronic and complicated with other bacteria.
7. IC is usually characterized by low mortality and high morbidity. Complicating factors such as poor housing, parasitism, and inadequate nutrition may add to severity and duration of the disease. When complicated with other diseases such as fowl pox, infectious bronchitis, laryngotracheitis, *Mycoplasma gallisepticum* infection, and pasteurellosis, IC is usually more severe and prolonged, with resulting increased mortality

Necropsy:

H. paragallinarum produces an acute catarrhal inflammation of mucous membranes of nasal passages and sinuses. Frequently, a catarrhal conjunctivitis and subcutaneous edema of face and wattles occur.

Diagnosis:

Isolation and Identification of Causative Agent:

1. Specimens should be taken from two or three chickens in the acute stage of the disease.
2. The skin under the eyes is seared with a hot iron spatula, and an incision is made into the sinus cavity with sterile scissors. A sterile cotton swab is inserted deep into the sinus cavity where the organism is most often found in pure form. Tracheal and air sac exudates also may be taken on sterile swabs.
3. The swab is streaked on a tryptose blood agar plate, which is then cross-streaked with a *Staphylococcus* culture and incubated at 37°C in a large screw-cap jar in

- which a candle is allowed to burn out. *Staphylococcus epidermidis* which are commonly used as “feeders,” should be pretested because not all strains actively produce the V-factor.
4. At the simplest level, IC may be diagnosed on the basis of a history of a rapidly spreading disease in which coryza is the main manifestation, combined with the isolation of a catalase-negative bacterium showing satellitic growth.
 5. A PCR test specific for *H. paragallinarum* has been developed.
 6. Serology: No totally suitable serological test exists for the diagnosis of infectious coryza. However, at this time, the best available test methodology is the HI test. The simple HI is based on whole bacterial cells of Page serovar A *H. paragallinarum* and fresh chicken erythrocytes. An alternative serological test is a monoclonal antibody-based blocking ELISA.

Differential diagnosis:

Infectious coryza must be differentiated from other diseases, such as chronic respiratory disease, chronic fowl cholera, fowl pox, ornithobacteriosis, swollen head syndrome, and A-vitaminosis. Because *H. paragallinarum* infections often occur in mixed infections, one should consider the possibility of other bacteria or viruses as complicating IC, particularly if mortality is high and the disease takes a prolonged course.

Prevention:

1. Management Procedures:

Because recovered carrier birds are the main source of infection, practices such as buying breeding males or started chicks from unknown sources should be discouraged. Only day-old chicks should be secured for replacement purposes unless the source is known to be free of IC. Isolation rearing and housing away from old stock are desirable practices. To eliminate the agent from a farm, it is necessary to depopulate the infected or recovered flock because birds in such flocks remain reservoirs of infection. After cleaning and disinfection of the equipment and houses, the premises should be allowed to remain vacant for 2-3 weeks before restocking with clean birds.

2. Vaccination:

Commercial IC bacterins are widely available. Thimerosal inactivated aluminum hydroxide-based vaccines or formalin inactivated compared mineral oil adjuvant vaccines are used. Bacterins generally are injected in birds between 10-20 weeks of age and yield optimal results when given 3-4 weeks prior to an expected natural outbreak. Two injections given approximately 4 weeks apart before 20 weeks of age seem to result in better performance of layers than a single injection. Injection of the bacterin into the leg muscle gave better protection than when injected into the breast muscle. Significant immunity has been demonstrated for about 9 months following vaccination

Control:

Various sulfonamides and antibiotics are useful in alleviating the severity and course of IC. It should be noted that drug resistance does develop and hence the performance of antimicrobial sensitivity tests is recommended. Strains of *H. paragallinarum* resistant to

various antibiotics did not carry plasmids. Relapse often occurs after treatment is discontinued and the carrier state is not eliminated. Erythromycin and oxytetracycline are two commonly used antibiotics.