SOLVEDA®

Optimum Solving ... Optimum Recovery

# Infectious Bronchitis

## Disease Overview


Cornell University

# Plan of Talk

- Introduction
- Etiology
- Transmission
- Economic importance
- Pathogenesis
- Clinical signs
- Post mortem lesions
- Diagnosis

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# Introduction

- Infectious Bronchitis (IB) is a viral disease affecting chickens of all ages worldwide.

- Infectious Bronchitis virus (IBV) targets:
  1. Respiratory tract
  2. Urogenital tract.

# Cont. ...

- **IBV mainly causes:**
  1. Respiratory disease in the infected birds.
  2. Drops in egg production in layers and breeders.
  3. False layers.
  4. Kidney damage can also occur.

# IB … First Recognized

United States of America in the 1930s

- An acute respiratory disease mainly of young chickens.
- A viral etiology was established, and the agent was termed avian infectious bronchitis virus (IBV).

# IB … Different Forms

**IB occurs world-wide and assumes a variety of clinical forms:**

1. Infection of respiratory tract.
2. Infection of the urinary system.
   a) IB can be nephropathogenic causing acute nephritis and urolithiasis.
   b) After apparent recovery, chronic nephritis can lead to death at a later time.
3. Infection of the oviduct of:
   a) Immature birds, leading to permanent damage.
   b) Laying hens, leading to:
      i. Cessation of egg-laying, sudden drop in egg production.
      ii. Production of thin-walled and misshapen shells with loss of shell pigmentation.

# Cont. ...

› IBV has also been reported to produce disease of the proventriculus (Yu *et al*., 2001).

# IB … Host Affinity

- IB affects chickens of all ages.
- They are the only species reported to be naturally affected.

# IB … Virus Shedding

› Vaccine and field strains of IBV may persist in the **caecal tonsils** of the intestinal tract and be **excreted in faeces** for weeks or longer in clinically normal chickens (Alexander *et al*., 1978).

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# Etiology

The Infectious Bronchitis Virus

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# Transmission

- IB is highly contagious.
- The incubation period is relatively short, 18 - 36 hours.
- Disease spreading through an entire flock within one or two days.

# Horizontal Transmission

- The IB virus spreads horizontally by:
  1. Aerosol transmission (sneezing)
  2. Contaminated organic material, drinking water and equipment.

# Vertical Transmission

- Vertical transmission (from the hen to their progeny through the egg) has not been shown to be important.

- However, surface contamination of eggs with the IB virus is a possible way by which the virus can be spread in hatcheries or egg packing stations.

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# Economic Importance

## Broilers

1. Poor food conversion rate.
2. Reduced weight gain.
3. Predisposing factor for secondary infections.

## Future Layers and Breeders

When birds are infected in the first few days of life with a very virulent IB virus, permanent damage in the oviduct may occur;

- These birds may mature like normal hens but produce no eggs.
- These so-called false layers have in the meantime consumed their full share of the investment in food and housing without any return

# Layers

## Layers

- Drops in production.
- Poor quality eggs.
- Production often does not return to pre-infection levels.

## › Breeders

- The hatchability rate may also be negatively affected.

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# Pathogenesis

- Infectious bronchitis virus initially infects and replicates in the upper respiratory tract causing the loss of protective cells lining the sinuses and trachea.

- After a brief viraemia, the virus can be detected in the kidneys, reproductive tract, and caecal tonsils.

# Cont. ...

- Some strains of IBV, which are referred to as nephropathogenic are known to cause lesions in the kidney.
- Renal damage associated with different IB strains is an increasingly important feature of IB infections, especially in broilers.

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# Clinical Signs

1. Young chickens are depressed and huddle under the heat source.
2. Respiratory signs:
   a) Gasping
   b) Coughing
   c) Tracheal rales
   d) Nasal discharge
3. When the kidneys are affected, increased water intake, depression, scouring and wet litter are commonly observed.

# Cont. ...

4. Birds in lay have a marked drop in egg production and an increased number of poor quality eggs may be produced.
5. The external and internal quality of the eggs may be affected, resulting in misshapen or soft-shelled eggs with watery content.
6. The hatchability rate of the eggs may be affected.

# Cont. …

- The most severe clinical signs are seen in chickens younger than 6 weeks of age.
- The morbidity rate is extremely high.
- The mortality rate is dependent on:
  a) Age of the chickens when infected.
  b) Presence of secondary invading organisms such as E. coli.

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# Post Mortem Lesions

- Post mortally, lesions are found in the respiratory tract and urogenital tract.
- Renal damage associated with different IB strains is an increasingly important feature of IB infections, especially in broilers.

# Cont. ...

## Respiratory

1. Serous, catarrhal, or caseous exudates in the trachea, nasal passages and sinuses.
2. Cloudy air sacs which may contain yellow caseous exudates.
3. Caseous plug may be found in the trachea.
4. Pneumonia.

## Urogenital

1. Swollen, pale kidneys, with distended tubules and ureters containing urate crystals in nephropathogenic cases.
2. Fluid yolk material may be found in the abdomen of birds in production (egg peritonitis)
3. Degeneration of the ovary and swollen oviducts.

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# Diagnosis

1. **Isolation or identification of the causative agent**
   1. Essentially required for a definitive diagnosis of IB.
2. **Clinical signs**
   1. Diagnosis of Infectious Bronchitis on the basis of clinical signs alone is very difficult.
3. **Decreased egg production and poor egg quality**
   1. The sign "egg drop" is even less specific.
   2. Post mortem findings are often not conclusive.
4. **Laboratory tests**
   - Laboratory tests to identify the viral genome, viral antigen (proteins) or antibodies against the virus are important to confirm IBV infections.
   - Testing serum samples at intervals (for example at the time of the clinical signs and 2 or 3 weeks later) provide the best basis for serological diagnosis. This is also applicable for monitoring vaccination results.

# Cont. ...

## Respiratory signs

Respiratory signs similar to IB are observed in many other respiratory diseases such as:

1. Newcastle Disease
2. Infectious Laryngotracheitis
3. Pneumovirus infections.

Often these diseases may present themselves in milder forms making it impossible to distinguish one from the other.

# SOLVEDA®

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scientific Office:
12 Abbas El Akad St., 9th district, El Obour City, Egypt
Tel. and fax: +2 02 43126096
Cellular: +2 0120 51 00 700
E-mail: info@solveda.net

Factory
192 small industrial area, El Obour City B/C, Egypt
Tel.: (+2) 02 4487 40 50
(+2) 02 4487 44 80
Website: www.solveda.net