

Infectious bronchitis

(IB)

DEF:

It is an acute contagious disease affecting respiratory tract of **Young chicken** ch.ch by tracheal ralls, cough & sneezing

-In Semi mature birds infected with nephrogenic strain ch.ch by inflammation of kidney after mild respiratory sings

-In Laying flock drop in egg production (10 – 20 %) for 3-4 weeks with change in shell quality, broken claza (diff in ND) & watery albumen

-IBV targets not only the respiratory tract but also urogenital tract

-IBV causes respiratory disease and also drops in egg production in layers and breeders

-kidney damage can also occur.

ECONOMIC IMPORTANCE:

- 1-Poor growth performance and mortality due respiratory disease in broilers
- 2-Complication with Mycoplasma & E.coli
- 3-High condemnations rates
- 4-High losses due to drop in egg production and renal damage
- 5-High prevention cost

CAUSE:

- sRNA ==corona virus, pleomorphic enveloped with spikes.
- multiplies in kidney, respiratory & oviduct
- withstand PH ranged from 2-12
- inactivated after 15 minutes at 56c⁰ and 90 minutes at 45c⁰
- sensitive to most common disinfectants

Virus strains:

- Large number of strains differs antigenically
- Many methods are used to differentiate and classify isolates of IBV, Serotype and more recently genotype classification, based on features of the S protein, are used to classify strains.
- IBV serotypes have been defined by VN and HI tests.

Major classification

1-Classical IB= affect respiratory & reproductive systems

(Massachusetts =H120, H52, Ma5)

(Connecticut and Arkansas (Ark) serotype)

2-Gray (nephrogenic) ==kidney lesions

3-Variant =virulent, D247, 4/91

Differentiated between both by ---HA --- ELISA

-IB virus can be cultivated by inoculation on ECE via allantoic sac 9-11 days and after 4-5 blind passages =causing curling &dwarfing of embryo

Epidemiology

- world wide distribution
- several different serotypes can co-circulate in the same area at the same time
- chickens are the most important natural hosts for IB
- all ages of chickens can be infected
- the most severe clinical signs are seen in chickens younger than 6 weeks of age
- morbidity rate is dependent on the age of chickens when infected, and presence of secondary invading organisms such as E.coli

Transmissions :(highly contagious)

- I.P==18-36 hrs
- air borne infection by aerosol can spread to entire flock within one or two days
- contaminated organic material, drinking water

Pathogenesis

- IBV initially infects and replicates in the upper respiratory tract causing 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.
- some strains which are nephropathogenic cause lesions in the kidney
- renal damage associated with different IB strains which is important feature of IB infections, especially in broilers

Forms of disease:

1-Respiratory form

A-sings

- general signs (off food, ruffled feather ...)
- Young ages (2- 3 weeks)-gasping, cough, sneezing, tracheal ralls& nasal discharges
- little mortality not exceeds 1% but resp. complication with other bacteria increase mortalities

B-P/M lesions

- Rhinitis, tracheitis, mild conjunctivitis
- caseous plug in tracheal bifurcations
- cloudy air sacculitis, pericarditis, pneumonia==occur due to complications

2-Nephropathogenic form (nephropathogenic strain)

In some cases in broilers follow respiratory sings or in semi mature (6-10 weeks)

A-Sings

- general sings (depression, ruffled feather)
- wet dropping +whitish diarrhea
- dropping with ureates
- increase water intake
- mortality up to 25%

Complicated factors for nephrogenic:

1-increase Ca intake

2-sulphonamides intake + **nephrogenic strain** =
urolitiasis in chickens

3-nephrotoxins

B-P/M lesions

- swollen pale kidneys with distended tubules, cord like ureters filled with ureates
- ppt of Ca ppt. in kidney lobules

3-Reproductive form

-Infection occur in layers& layers breeder during production show mild respiratory sings with drop in egg production with change in egg internal & external

-infection in young age or recovered birds showing:

1-appear permanent decrease in egg production

2-below production curve

3-some bird showing egg peritonitis

P/M lesions

(False layer = blind layers)

-shortening &dwarfing in oviduct

-normal active ovary but short oviduct when happen ovulation ova descend in abdominal cavity

-this can be detected by (Trape nest)

-fluid yolk material may found in the abdomen of birds in production

-degeneration of the ovary and swollen oviducts

DIAGNOSIS:

1-history (respiratory signs, egg production curve and poor egg quality) 2-sings 3-P/M

4-lab.diagnosis

A-Isolation

- On 9-11 day of age E.C.E SPF eggs, several blind_passages necessary before clinical signs characteristic of IBV are observed in embryos
- Typical lesions in embryos occurring at 5-7 days post inoculation as culling, dwarfing and red hemorrhagic with white urates deposits in kidneys

B-serological identifications (Abs for 7-10 days)

- IFAT, RT-PCR, AGPT, VNT, HI (need phospholpase C type 1 and ELISA

CONTROL:

1-Biosecurity==Hygienic measures;
avoid stress factors, separation of
chicken ages
2-vaccination

PREVENTION:

NB==IB, ILT, and IC----infect
chicken only

2-vaccination :(two types of vaccines)(2 weeks interval)

1-live attenuated classical vaccine, Massachusetts serotype (H120) =Spray or eye drop alone (common used, mild vaccine) or Ma5 vaccine

*in combination with Hitchner or Lasota during 1st week of age

* (100 unit IB, 500 units Lasota)

*H120 against classical IB resp.

2-live attenuated variant vaccine (D274, 4/91) =against gray variant strain

Methods: by oculo-nasal, spray, drinking water

3-oil adjuvant vaccine ==

- for **breeder flock** to provide 1day old chick maternal immunity & protect it

from false layer

- Long lasting immunity, by injection (4-6weeks)

Protectotypes(cross protection)

New serotypes can emerge as a result of only a few changes in the amino acid sequence of S1 part, although a new serotype emerges, much of the virus genome remains unchanged, and this may be the reason that IB vaccines from a certain serotype may provide protection against IB strains not belonging to that serotype.















