



WELCOME TO WEBINAR CHRONIC RESPIRATORY DISEASE
www.drbcdutta.com

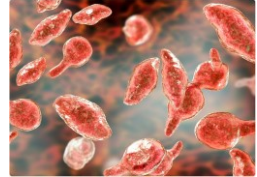
27-12-2020

Dr B C Dutta

1

CHRONIC RESPIRATORY DISEASE

- Mycoplasmosis is an infectious disease caused by the micro-organism called mycoplasma; *Mycoplasma gallisepticum* (MG) affects chickens & turkeys, *M. synoviae* (MS) also affects chickens and turkeys, and *M. meleagridis* (MM) affects only turkeys
- Chronic Respiratory Disease, Commonly known as CRD, is caused by *M gallisepticum* with worldwide prevalence and has great economic importance.



- CRD is a major problem in India, Bangladesh & Nepal causing severe Respiratory disease
- *M synoviae* causes infectious Synovitis in poultry with Exudative Tendonitis & Synovitis and subclinical respiratory problem

27-12-2020

Dr B C Dutta

2

CHRONIC RESPIRATORY DISEASE OR CRD

- Mycoplasma is an organism similar to bacteria, but lacks a cell wall, which makes it extremely fragile
- Mycoplasma can be easily killed by disinfectants, heat, sunlight & others.
- They only remain viable in the environment, outside the chicken body, for typically up to 3-5 days.
- For this reason, Mycoplasma is very easy to eliminate on single-age, all-in all-out poultry farm with proper Shed Cleaning & Downtime management
- Chronic Respiratory disease (CRD) is slow in onset and chronic in nature



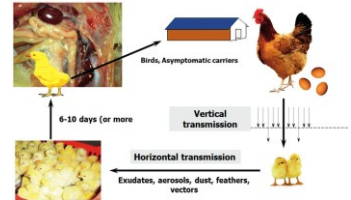
27-12-2020

Dr B C Dutta

3

TRANSMISSION OF MYCOPLASMOSIS OR CRD

- Infection is mainly transmitted through Hatching Egg (**Vertical Transmission**).
- **Carrier Birds:** The birds which carry the infections without symptoms are responsible for horizontal spread of the disease. MG survives only few days outside host body and therefore **carrier birds are essential for disease transmission**
- Direct contact with infected birds in a flock are the reason of outbreak (**Horizontal Transmission**). In a multi age farm or on continuous production Layer/breeder farm Infection is difficult to control



27-12-2020

Dr B C Dutta

4

TRANSMISSION OF MYCOPLASMOSIS OR CRD

> **Through Air:** Transmission may occur via contaminated Dust, Droplets & Feathers carried through air. MG & MS travel short distance through air and is enough to create infection within shed or pen but not much importance from shed to shed, if minimum distance are maintained

> **Infection enters through Respiratory tract or conjunctiva**

> **Poultry Traffic:** 60% of Horizontal transmission due to cross contamination by people involve in poultry farming operation via clothing or equipment

> **Overcrowding** or increase in bird density increases horizontal spread of disease

27-12-2020 Dr B C Dutta 5

CHRONIC RESPIRATORY DISEASE OR CRD

Disease Production is influenced by

- The Virulence of the organism
- The no of the organism present
- Age of the birds
- Simultaneous presence of other infections
- Stress Factors like Chilling, Litter Ammonia, Dust, Nutritional deficiency & Overcrowding

The infection usually affects all birds in the flock but Severity & Duration varies

- More severe & longer duration during winter
- Affects younger birds more severely than adult birds

27-12-2020 Dr B C Dutta 6

CHRONIC RESPIRATORY DISEASE OR CRD

- The infection may last for few weeks to several months (even over 18 months)
- Mycoplasma is fragile outside the host body and survives few days in poultry house environment
- It may survive longer if protected by exudates and/or cold climate
- Uncomplicated CRD is difficult to recognise; CCRD or 'Complicated CRD' or 'Airsac Disease' is mostly seen in field conditions
- ND or IB may predispose CRD
- E coli & Infectious Coryza are the complicating factors
- Mortality is negligible in adults but heavy impact on egg production
- In Broiler, mortality is low in uncomplicated cases but may reach up to 30% in complicated infections

27-12-2020 Dr B C Dutta 7

SYMPTOMS & PM LESIONS OF CRD

Most characteristic SYMPTOMS in adult birds are

- Abnormal Respiratory Sounds
- Nasal discharge, Sneezing & coughing
- Breathing through the open beak
- Reduced Feed Intake and loss of body weight
- Decreased Egg production in laying hen
- Uncomplicated Infections are usually symptomless and cause mortality only in young chicks

The Post Mortem findings are

- Inflammatory Exudate in nasal passage, trachea, bronchi & Airsacs.
- Cheese like Inflammatory material in Airsacs
- Pneumonia may present in some degree
- In severe cases Pericarditis (Inflammation of pericardium, covering of heart), Perihepatitis (Inflammation of liver surfaces) may be seen

27-12-2020 Dr B C Dutta 8

MYCOPLASMA SYNOVIAE INFECTION

- MS cause Infectious synovitis resulting joint changes and lameness
- MS is most common cause of reduced growth in broiler & grower, and reduced egg production in layer/ breeder
- Infectious synovitis usually shows no symptoms or mild upper respiratory signs or severe respiratory condition when complicated with ND and/or IB
- MS can survive outside host body for only few days but may survive in the body several years.
- Infectious synovitis spread is similar like CRD but more rapidly
- MS is a vertically (Egg transmission) transmitted disease
- Infected flock starts shedding organisms after 14 – 40 days
- Horizontal spread happens readily in a flock by direct contact and through air between cages
- Route of entry through respiratory tract.
- Once infected, birds remain carrier for life
- Transmission also occur by poultry traffic through cloth, equipment & vehicles



27-12-2020

Dr B C Dutta

9

MYCOPLASMA SYNOVIAE INFECTION

- Natural infections may occur even 1 week age but acute form usually seen after 4 weeks age
 - Infections may be asymptomatic causing heavy loss due to poor growth
 - Infection may be respiratory form or joint form
 - Acute infections are followed by chronic form which last for whole life of the host; who remains as permanent carrier
- In the joint form, there are
- Marked Depression, Paleness of face & comb
 - Rapid loss of condition
 - Swelling of joints, the feet & hock are particularly affected with accompanying lameness
 - In the chronic case, swelling of joints with lameness occurs without systemic disturbance



27-12-2020

Dr B C Dutta

10

SYMPTOMS & PM LESIONS of MS INFECTION



- In Respiratory form, there may be
- Mild abnormal respiratory sounds with Nasal discharge
 - Morbidity is low, may be 10%
 - Severe respiratory symptoms are seen in complicated cases with virus or bacteria



- Post Mortem findings involves Changes in the joints include accumulation of fluid (oedema) and thickening of the tissue surrounding the joints
- The feet & hock joint are mostly affected but other may follow
- The inflammatory exudate becomes cheesy and usually orange to brown in colour
- Enlarged green liver

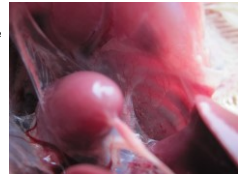
27-12-2020

Dr B C Dutta

11

DIAGNOSIS OF MYCOPLASMOSIS

- Neither the symptoms nor the PM findings are characteristic for MG or MS diagnosis
- A tentative diagnosis may be made in case of MS on the basis of pale comb, leg weakness & enlarged hock joints.
- MS generated respiratory disease are similar to other respiratory infections. Practically CRD alone produces no clinical symptoms but PM reveals tracheal lesions with yellowish white exudate



- Confirmatory diagnosis by isolation of organism or demonstration of antibody by serology
- ELISA is commonly used for serological test of both MG & MS
- PCR is a simple, rapid & highly sensitive method of detecting Mycoplasma antigen in tissues

27-12-2020

Dr B C Dutta

12

TREATMENT OF MYCOPLASMOSIS

Both *M. gallisepticum* & *synoviae* are sensitive to most Antibiotics like

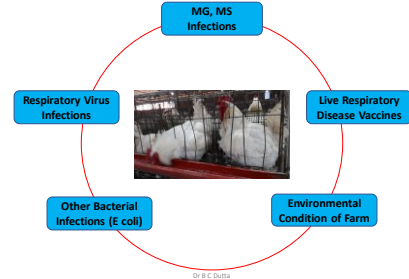
- Tetracyclines (Doxycycline, Oxytetracycline & Chlortetracycline)
- Neomycin
- Gentamycin
- Erythromycin
- Lincomycin
- Tylosin
- Spectinomycin
- Tiamulin
- Enrofloxacin
- Levofloxacin
- Tylosin is used successfully for the treatment of MG since long
- Tiamulin is regularly used for treatment of both MG & MS
- Lincomycin Neomycin is a good combination to treat CCRD
- Lincomycin Spectinomycin is a good combination to treat complicated Infectious Synovitis

27-12-2020

Dr B C Dutta

13

CONTROL OF MYCOPLASMOSIS



27-12-2020

Dr B C Dutta

14

CONTROL OF MYCOPLASMOSIS

- Control measures of both MG & MS are based on **preventing the spread of infection; both Vertical & Horizontal route**
- Infection spread via aerosols, contact with infected birds, and mechanical transmission by human, equipment, vehicles & litter
- **Distance is the best protection against Aerosol spread of infection**
- MS appears to be transferred between flocks over greater distances than MG
- Domestic and wild birds including Turkeys, guinea fowl, pheasants, quail, duck, geese pose a significant risk of MG to breeder, layer & broiler farms
- **Showering-In & Showering-Out and breaks of at least 48 hours after visiting infected flocks can help avoid mechanical transmission**
- Based on the above, it is essential to establish & implement strict Biosecurity program, All-In-All-Out production system and prevent direct & indirect contact of clean farms with infected farms, free range flocks, backyard chicken and wild birds
- **All breeder & broiler farms must be wild bird proof**

27-12-2020

Dr B C Dutta

15

CONTROL OF MYCOPLASMOSIS

MONITORING OF PROGENY

Infection of hatching eggs

- Cultural Examination of Swabs taken from dead embryo after candling or from dead-in-shell hatch or from the chicks die during early part of life. Older birds may also be swabbed, specially during laying period.
- Serological Examination of blood samples of the flock at regular interval even during laying period so that all birds are subject to taste once
- **Flocks may be declared uninfected with Mycoplasma only when serologically negative progeny obtained from negative parent stock and negative hatching eggs**
- Neither generation should have been subjected to anti Mycoplasma treatment
- By these method only a Mycoplasma-free breeder flock may be produced, and their progeny are expected to produce Mycoplasma-free chicks



27-12-2020

Dr B C Dutta

16

CONTROL OF MYCOPLASMOSIS

- Mycoplasmosis is so contagious that 1 or 2 infected bird in the pen can infect whole flock in very short time
- An infected hen remain carrier for life and passes the organism through eggs. Infected bird, if found should be removed immediately
- Flock may remain non-infective for longer period but suddenly outbreaks may arise after other respiratory infection predispose the onset



There are 3 different methods for control of Mycoplasmas that shall be used continuously in different Broiler producing areas, which includes

- DEPLETION (Elimination of positive breeder flocks)
- VACCINATION
- ANTIBIOTIC Treatment

Definitely Biosecurity is the common issue to control any disease

27-12-2020

Dr B C Dutta

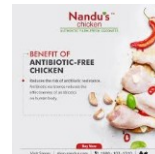
17

CONTROL OF MYCOPLASMOSIS - DEPLETION

- Elimination of infected breeder flocks is the long-term prevention strategy and the breeder producer must house Mycoplasma free parent stock
- Compliance with Mycoplasma free official Certification is mandatory for suppliers of Day-Old breeder chicks
- Broiler companies need to establish, manage & maintain Mycoplasma free status breeder through stringent Biosecurity and regular serology & PCR monitoring



The growing demand for broiler meat with reduced or no antibiotics makes it essential to place Mycoplasma free broiler chicks



27-12-2020

Dr B C Dutta

18

CONTROL OF MYCOPLASMOSIS - VACCINATION

- Live MG Vaccines (F & TS-11 strain) are commonly used in commercial layers.
- Live MG Vaccines are less used in breeders due to Safety issue & the risk of transmission to unvaccinated flock
- Live MS (MS-H strain) Vaccine is used in areas with close proximity to infected flock as in Multi-Age farming and where elimination of infected flocks are not feasible.
- In many countries Live MG Vaccines are used combinedly with Live MS Vaccines

Factors need to consider to optimize Vaccination program

- Only Infection Free flock to be vaccinated
- Mycoplasma surveillance history of the farm should be used to design the vaccination program
- Protection develops only after 3 weeks
- No Antibiotics should be administered before & after Live Vaccination

27-12-2020

Dr B C Dutta

19

CONTROL OF MYCOPLASMOSIS - VACCINATION

- Live MS vaccination is not only useful to control clinical signs and reduce the risk of Transmission but also helps to reduce the need of antibiotics
- Research and field experiences suggest Live vaccines help displace virulent-wild type Mycoplasma and provide a better long-term strategy for countries in SE Asia that cannot afford to deplete positive flocks
- Inactivated Mycoplasma vaccines used prior to egg production can induce high and uniform level of antibodies against MG & MS and prevent egg production drop & vertical transmission
- Many operators are using Inactivated Mycoplasma vaccines in combination with Live MG + MS and/or Antibiotics in breeders
- The combination is very costly but help reducing production loss & vertical transmission successfully if used judiciously

27-12-2020

Dr B C Dutta

20

CONTROL OF MYCOPLASMOSIS – ANTIBIOTIC INTERVENTION

- Mycoplasma is sensitive to most antibiotics and Antibiotic treatment are commonly prescribed by poultry veterinarian based on their experience & proven Cost benefits.
- When antibiotics are used for an extended period, it is recommended to rotate the product to preserve their efficiency
- Although Medication is successful to elevate some clinical signs and to reduce transmissions, it is not a long term solution as it does not eliminate the possible transmission of wild type Mycoplasmas to other farms.
- Once a flock is diagnosed positive, it remain source of transmission for rest of the life to the other farms in the production system
- Many Medication protocols for treatment of Mycoplasma positive breeder flocks; a typical program includes administration of Antibiotics in feed (Chlortetracycline one Week/month) and drinking water (Tylosin 3 – 5 days/month)
- It has been beneficial to use an AGP (following the regulations of the country) in Pre-starter/Starter Feed or use of typical Anti-mycoplasma drug in drinking water for first 3 days followed by 2 days prior to booster ND vaccination

27-12-2020

Dr B C Dutta

21

CONTROL OF MYCOPLASMOSIS IN BREEDER FARMS

- MG positive breeder flocks should be eliminated due to huge risk of Production drop, increased hen mortality due to Egg peritonitis, severe respiratory problem and huge impact on broiler health & live performance
- Once the breeder flock is positive, it is important to prevent transmission through following procedure:
 - Strengthen Biosecurity and limit traffic to the farm
 - Positive farms must be labelled as risk & under quarantine
 - Entry point Footbath is must and disposable or dedicated footwear should be worn at all times
 - Regular shower-in & shower-Out is ideal practice
 - Feed delivery, Egg Pick-up & service personnel visit must be done at the end of the week. A 48 hours break (including Showering-in & Showering-Out) is essential before going to a fresh farm
 - All vehicles should be disinfected before going to another farms
 - Staff & Equipment of the infected flock shall be labelled & work as separate farm
 - Separate Incubator & Hatcher should be used for eggs from +ive flocks to prevent transmission to chicks
 - Broiler chicks from positive flocks should be placed together and shall not mix with negative one
 - Positive breeder flock should be treated with Antibiotics as advised by poultry veterinarian



27-12-2020

Dr B C Dutta

22

CONTROL OF MYCOPLASMOSIS IN BROILER FARMS

- House Chicks only from Mycoplasma free breeder and/or Hatchery
- All-In All-Out Production is must
- Distance between Sheds shall be minimum 30 ft but preferred is 50 ft
- Control of Dust (harbour droplets carrying Mycoplasma released from coughing & sneezing) in poultry house environment helps reducing horizontal transmission



- Avoid exposure to predisposing infections of ND & IB through Scientific Vaccination considering local challenge & existing serotypes
- Avoid complicating infections of E coli in farms through best Husbandry practice

27-12-2020

Dr B C Dutta

23

CONTROL OF MYCOPLASMOSIS IN BROILER FARMS

- Avoid Overcrowding which increases horizontal spread of infections
- Avoid complicating factors like Environmental Stress (Heat Stress, Chilling in Winter & High Humidity), Litter Ammonia & Poor Ventilation



- 100% Implementation of Biosecurity
 - Restrict entry of poultry Traffic
 - Entry Point Footbath & Spray of disinfectant
 - Dedicated Shoes & Clothing

27-12-2020

Dr B C Dutta

24

THANK YOU

<https://sites.google.com/view/drbaichandradutta/home>