MYCOPLASMA INFECTIONS

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Etiology

M.gallisepticum (MG)

M.synoviae (MS)

M.meleagridis (MM)

M.iowae (MI)

Role of *Mycoplasma* species in respiratory system Infections

Mycoplasma + ***E. coli***

Mycoplasma + Adenovirus

Mycoplasma + Reovirus

Mycoplasma + *Avibacterium paragallinarum*

IBV+ ***E. coli***

NDV + ***E.coli***

NDV (vaccine) + **Mycoplasma** + ***E.coli***

AmPV + ***E.coli***

Etiology

Gram negative, usually in coccoid form but pleomorphic structures can be seen

Does not have a cell wall

Requires complex media for growth

Embryonated chicken eggs can also be used for the culture of the bacteria

Egg-like colony form are seen on media

Mycoplasma gallisepticum lyses horse erythrocytes while hem agglutinating turkey/chicken erythrocytes

Resistance to Environmental and Chemical conditions

Disinfectants are effective

Resistant to antibiotics which affects the structure of the cell wall

Sensitive to environmental conditions

Long life in exudate and cold

Can survive for 1-3 days in chicken feces

The life time decreases when the temperature increases

Can survive in egg yolk for 6-18 weeks.

Survive 6 days at room temperature in allantoic fluid

ECE infected with *M.gallisepticum*, be inactivate in 11-14 hours at 45.6˚C

If liquid cultures are lyophilized at -30˚C for 2-4 years, stays alive for a long time

Pathogenicity

Turkeys are more susceptible to MG infection than chickens

Live F strain, very pathogenic for turkeys than chickens

M.gallisepticum infection is often caused by environmental and complicated by other microorganisms, the pathogenicity can be differ

When MG-containing exudates or liquid cultures inoculated into embryonated chicken egg yolk, embryos dyes in 5-7 days

Epidemiology-1

Chickens and turkeys naturally susceptible to MG infection

Can be isolated from other poultry such as pheasant, quail, goose, duck and parrot

The disease is more serious in the winter months

Direct transmission: contact with infected carriers

Indirect transmission: with infected lint, dust, streams and contaminated equipment

Clinical symptoms usually develop slowly and the disease lasts a long time

Epidemiology-2

4 stages in lateral transmission of chickens

- Latent phase
- 5-10% infection in population
- 90-95% infection in population
- The entire population is infected

Vertical transmission with eggs

It is also transmitted by artificial insemination

Clinical Signs

Incubation period

- Usually 4 weeks in natural conditions, but many additional clinical symptoms plays a role, therefore unexplained
- 6-10 days in turkeys for 6-21 days in experimental conditions

When the clinical findings are not complicated, occur lightly before hatching

In young animals, although they are serologically positive, no clinical signs may occur

The Importance of Clinical and Necropsy Findings in Infection

Severe to mild upper respiratory tract symptoms

Mortality levels can reach from 1% to 5-10%

Air sac inflammation is quite important in necropsy findings. The involvement of other agents change the situation

Increase in discarded carcass rate in broiler flocks (>1%)

Economic importance of *Mycoplasma* infection

Increase in death rate

Additional treatment costs

High discard rate

Decrease in egg production

Deterioration in egg shell quality

Decrease in hatching efficiency

Calculation of economical loss

Broiler

- 5-10% live weight loss
- 1% additional mortality

Layers

- 10-15 eggs/chicken
- 3-5% additional mortality-discard

Breeding

- Additionally >3% decrease in hatching efficiency

Diagnosis

Direct Diagnosis (Isolation, PCR)

- Trachea, air sac, lung, sinus contents
- Swab samples taken from the trachea, esophagus, cleft palate and cloaca
- Semen from roosters and eggs follicles from chickens
- If in incubation period, dead chicks under the shell and chicks that broke but did not hatch

Indirect Diagnosis (Serology)

- Blood serum

Differential Diagnosis

In chickens

- IBV, NDV, APV infections
- Infectious coryza and fowl cholera
- It should also be differentiated from *M.synoviae* infections

In turkeys

- Pasteurella infections, chlamydiosis, cryptosporidiosis, MS infections and Vitamin A deficiency should be differentiated

Mycoplasma Control Program

Breeders being negative for mycoplasma

Biosecurity

Treatment

Vaccination

Treatment

Treatment of breeding flocks (except MG)

Treatment of layers and broiler flocks

Antibiotics Used for Mycoplasma Infection

Macrolides (tylosin, erythromycin, aivlosin, spiramycin, kitasamycin)

Tetracyclines (chlortetracycline, oxyteracycline, doxycycline)

Tiamulin

Quinolones (enrofloxacin, danofloxacin, norfloxacin, imequil)

Lincosamides (linkomycin, kanamycin)

Aminoglycosides (streptomycin, spectinomycin, gentamicin, neomycin)

Mycoplasma Vaccines

Inactive vaccines

Live vaccines

- F, **6/85, ts-11**
- K5054
- MS-H

Recombinant vaccines

Result

Mycoplasma Control program must be generated for poultry businesses. For this purpose;

- Periodic monitoring of breeding flocks
- Biosecurity
- Treatment procedures in infected flocks
- Prevention of losses due to mycoplasma