

Avian Leucosis



Outline

- Introduction
- Causitive agent(s)
- Economic Impact
- Transmission
- Clinical Signs
- Diagnosis and Treatment
- Prevention and Control



Introduction

- Lymphoid leukosis is the most common form of the leukosis/sarcoma group
- Lymphoid leukosis occurs naturally only in chickens.
- The infection is known to exist in virtually all chicken flocks
- Tumor mortality ($\sim 1\% - 2\%$), with occasional losses of $\geq 20\%$.



Introduction

- Subclinical infection assoc. with egg production and quality problems.
- In recent years this control program has expanded, and infection has become infrequent or absent in certain commercial flocks.



- Family *Retroviridae*:
 - Genus Alpharetrovirus
 - 6 subgroups:
 - A, B, C, D , E&J
 - A and B are most prevalent in western countries.
 - J assoc. with myloid neoplasms in England
 - E non-oncogenic endogenous viruses
 - All strains of avian leukosis virus are oncogenic.



Host& transmission

- Chickens are the natural host
- Other hosts; pheasants, partridges, and quail.
- Virus transmitted vertically (no antibodies)
- Horizontal infection after hatching(transient viremia then antibody production).
- The earlier the infection, the more likely it is to lead to tolerance, persistent viremia, and tumors.



Host& transmission

- 4 classes of avian leukosis virus infection :
- no viremia, no antibody (V-A-) e.g. genetically resistant birds
- no viremia, with antibody (V-A+); e.g. Genetically susceptible birds
- with viremia, with antibody (V+A+); late infection
- with viremia, no antibody (V+A-). E.g. early infection
- Transmission can be reduced or eliminated by strict sanitation.
- Infected cocks may act as virus carriers (venereal infection)



Transmission

- Highly contagious
- The virus matures into a fully infective, enveloped form in the epithelium of the feather follicle
- Dust or dander from infected chickens is particularly effective in transmission.
- Infected chickens continue to be carriers for long periods
- Avirulent strains vary greatly in their transmissibility among chickenstransmitted.



Clinical signs & lesions

- Few typical clinical signs. These may include inappetence, weakness, diarrhea, dehydration, and emaciation.
- Enlarged bursa and an enlarged liver by palpation
- Low egg production
- Diffuse or nodular lymphoid tumors are common in the liver, spleen, and bursa and are found occasionally in the kidneys, gonads, and mesentery.
- Bursal lymphomas may be small and seen only after careful examination
- Microscopically, the tumor cells are uniform, large lymphoblasts. Mitotic figures are frequent.



Clinical signs

- In addition to lymphoid neoplasms, Marek's disease virus can also induce
 - Transient paralysis
 - Early mortality syndrome
 - Cytolytic infection
 - Persistent neurologic disease.
- Typically, affected birds show only depression before death
- A transient paralysis syndrome has been associated (ataxic for periods of several days and then recover)





Diagnosis

- **Clinical signs and lesions:** are most important
- lymphoid leucosis in various organs.
- Presence of bursal
- leucosis can develop in chickens as young as 14 wk old
- Histology
- Virus isolation, serology and PCR, are useless.



❑ Biosecurity:

- Improve management and hygiene
- Breeding for genetic resistant breeds
- Eradication from primary breeding stocks is the most effective means
- Vaccination for tumor prevention has not been promising.



Comparison of marek's vs leucosis

Feature	Lymphoid leukosis	Marek's disease lymphoma
Liver	Greatly enlarged; diffuse, miliary or nodular tumours; moderately firm	May be moderately to greatly enlarged; miliary or nodular tumours; firm
Spleen	Usually enlarged; diffuse, miliary or nodular tumours; soft	Often atrophic; may be enlarged; usually diffuse tumours
Bursa of Fabricius	Usually enlarged; nodular tumours	May be diffusely enlarged
Bone marrow	Often tumorous; diffuse or focal	No changes
Blood	Occasionally lymphoblastic leukaemia	May be lymphocytosis or lymphocytic leukaemia
Cytology and histopathology	Lymphoblasts; mainly extravascular infiltrations	Pleomorphic, sometimes blastic, lymphoid cells in perivascular locations
Other organs and tissues often grossly involved	Kidneys, ovary	Nerves, kidneys, ovary, proventriculus, heart, muscle, skin, iris



