Chicken infectious anemia

Definition and Synonyms:

Chicken infectious anemia (CIA) was first recognized in Japan (1979), as a new disease in young chickens caused by a novel virus agent. The disease is characterized by:

- 1. Aplastic anemia.
- 2. Generalized lymphoid atrophy.
- 3. Concomitant immunosuppression.
- 4. Frequently complicated by secondary viral, bacterial, or fungal infections.
- 5. The virus appears to play a major role in the etiology of a number of multifactorial diseases associated with hemorrhagic syndrome and/or aplastic anemia

Synonyms

CIA and closely associated syndromes have commonly been

- 1. Termed hemorrhagic syndrome.
- 2. Anemia-dermatitis.
- 3. Blue wing disease.

Economic Significance

Infection with CIAV has been confirmed as the cause of disease in chicken flocks between 2 and 4 weeks of age.

- 1. In these flocks growth was retarded.
- 2. Mortality was generally between 10 and 20%, but occasionally it reached 60%.
- 3. Aplastic anemia-hemorrhagic syndromes.
- 4. Risk factor for disease (gangrenous dermatitis, coccidiosis or respiratory disease).
- 5. Disease was associated with production losses • CIAV infection has only been recognized in chickens, turkeys and perhaps Japanese quail. Results of serologic tests suggest that CIAV has no public health significance

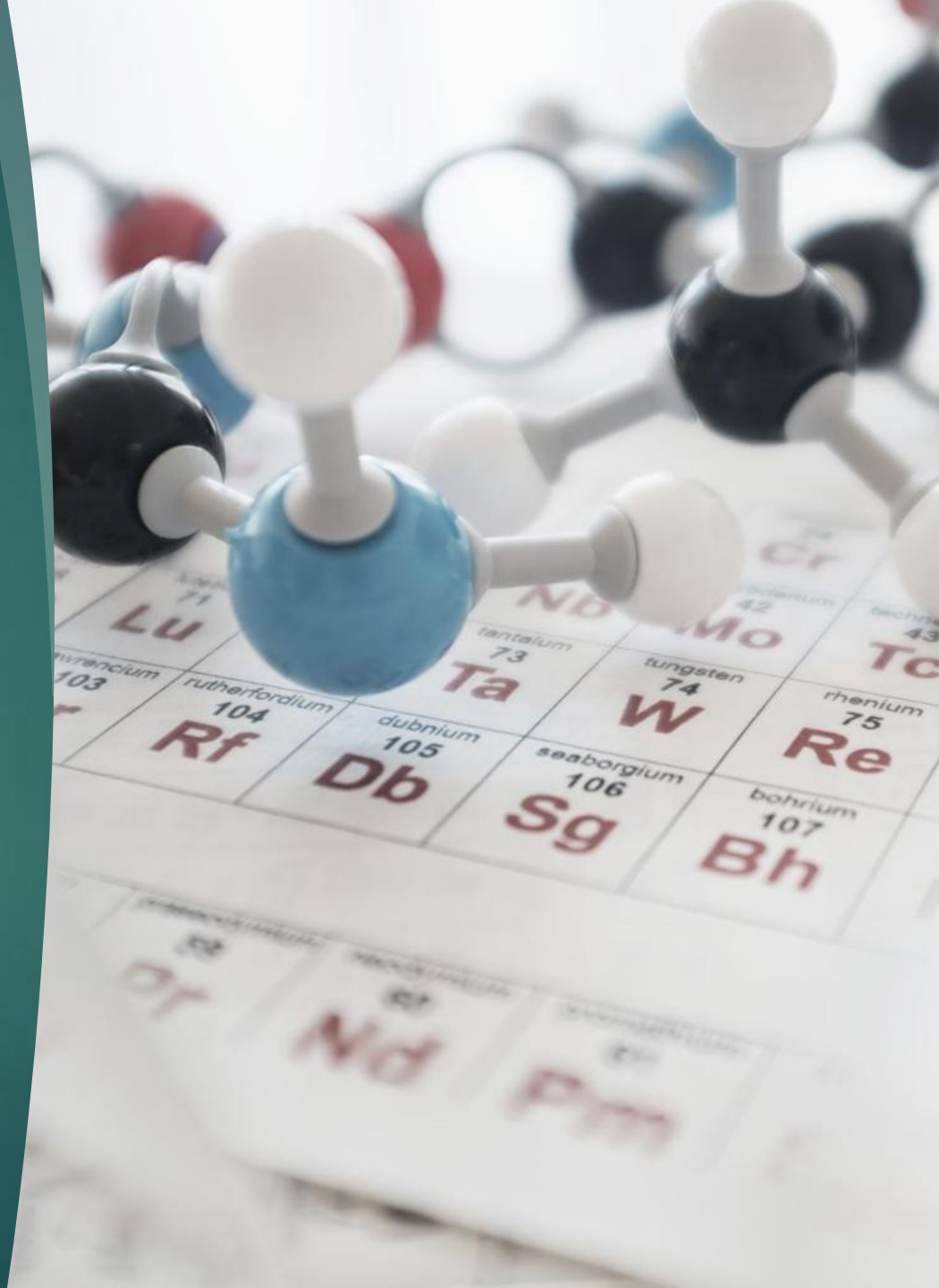
Etiology

Classification

- CIAV is classified as the only member of the genus Gyrovirus of the Circoviridae

Morphology

- CIAV virions consist of nonenveloped, icosahedral particles with an average diameter of 25 to 26.5 nm



Transmission

CIAV spreads both horizontally and vertically.

Horizontal transmission is very likely based on the presence of high concentrations of virus in the feces of chickens for 5–7 weeks after infection. Horizontal infection by direct or indirect contact most likely occurs via the oral route.

Vertical transmission of virus through the hatching egg is considered to be the most important means of dissemination, and occurs when antibody-negative hens become infected by horizontal infection or by semen from infected cocks.

Incubation Period

- In experimental infections, clinical signs generally develop after 10–14 days, and mortality begins at 12–14 days after inoculation. Under field conditions, congenitally infected chicks show clinical signs and increased mortality beginning at 10–12 days of age, with a peak at 17–24 days

Clinical Signs

The only specific sign of CIAV infection is anemia, with a peak at 14–16 days post inoculation (PI). Anemia is characterized by

- 1. Hematocrit values ranging from 6 to 27%.
- 2. Affected birds are depressed and can become pale.
- 3. Weight gain is depressed between 10 and 20 days after experimental infection.
- 4. Affected birds may die between 12 and 28 days PI.
- 5. If mortality does occur, it generally does not exceed 30%.
- 6. Surviving chicks completely recover from depression and anemia by 20– 28 days PI.

Pathology

Lesions associated with CIA may vary dependent on

1. The route of infection.

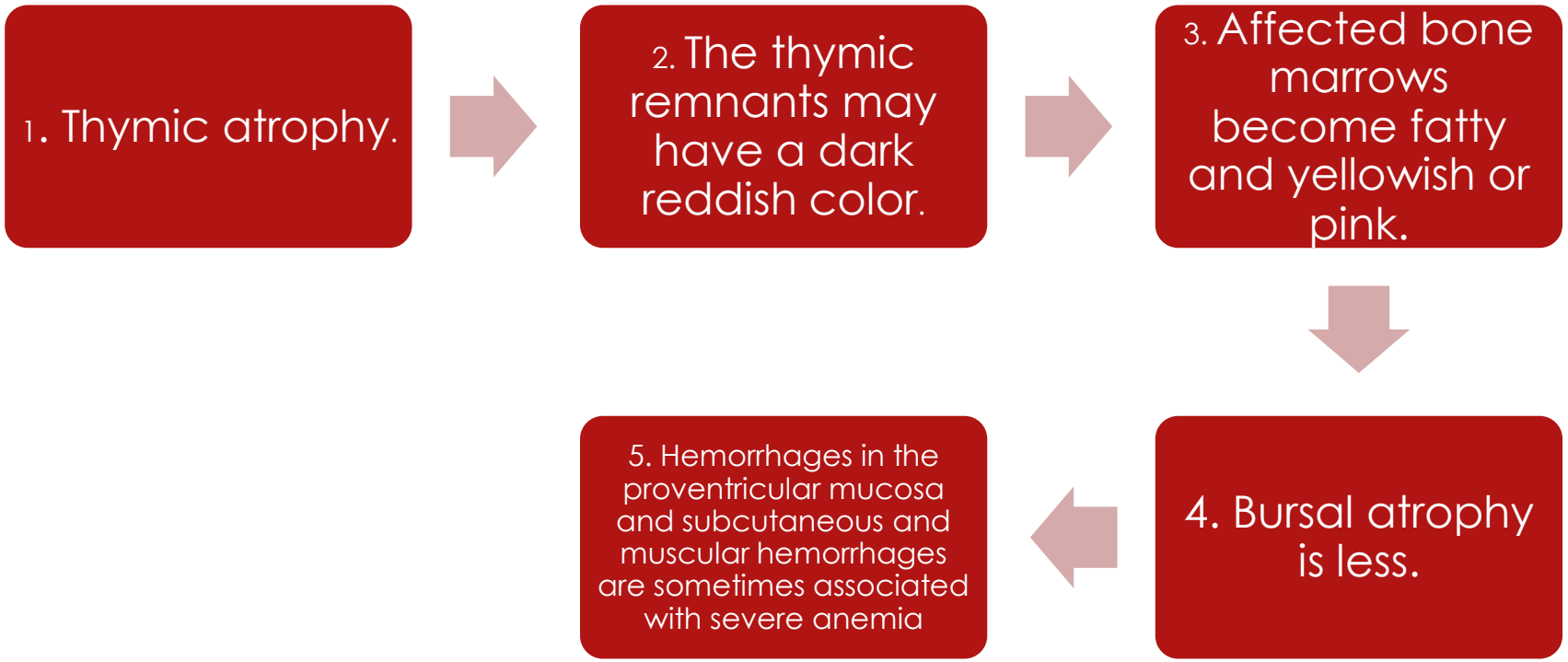
2. Age of exposure.

3. Viral dose.

4. Immune status of the host.

5. CIAV infection may often be involved in and complicated by other pathogens.

Gross Lesions



Microscopic Pathology

1. In the bone marrow, atrophy and aplasia involve all compartments and hematopoietic lineages.

2. Hematopoietic cells are replaced by adipose tissue or proliferating stroma cells.

3. Severe lymphoid depletion is seen in the thymus.

4. In bursa of Fabricius mild to severe atrophy of the lymphoid follicles with occasional small necrotic foci.

5. Depletion of T cells with hyperplasia of reticular cells is seen in the spleen lymphoid follicles.

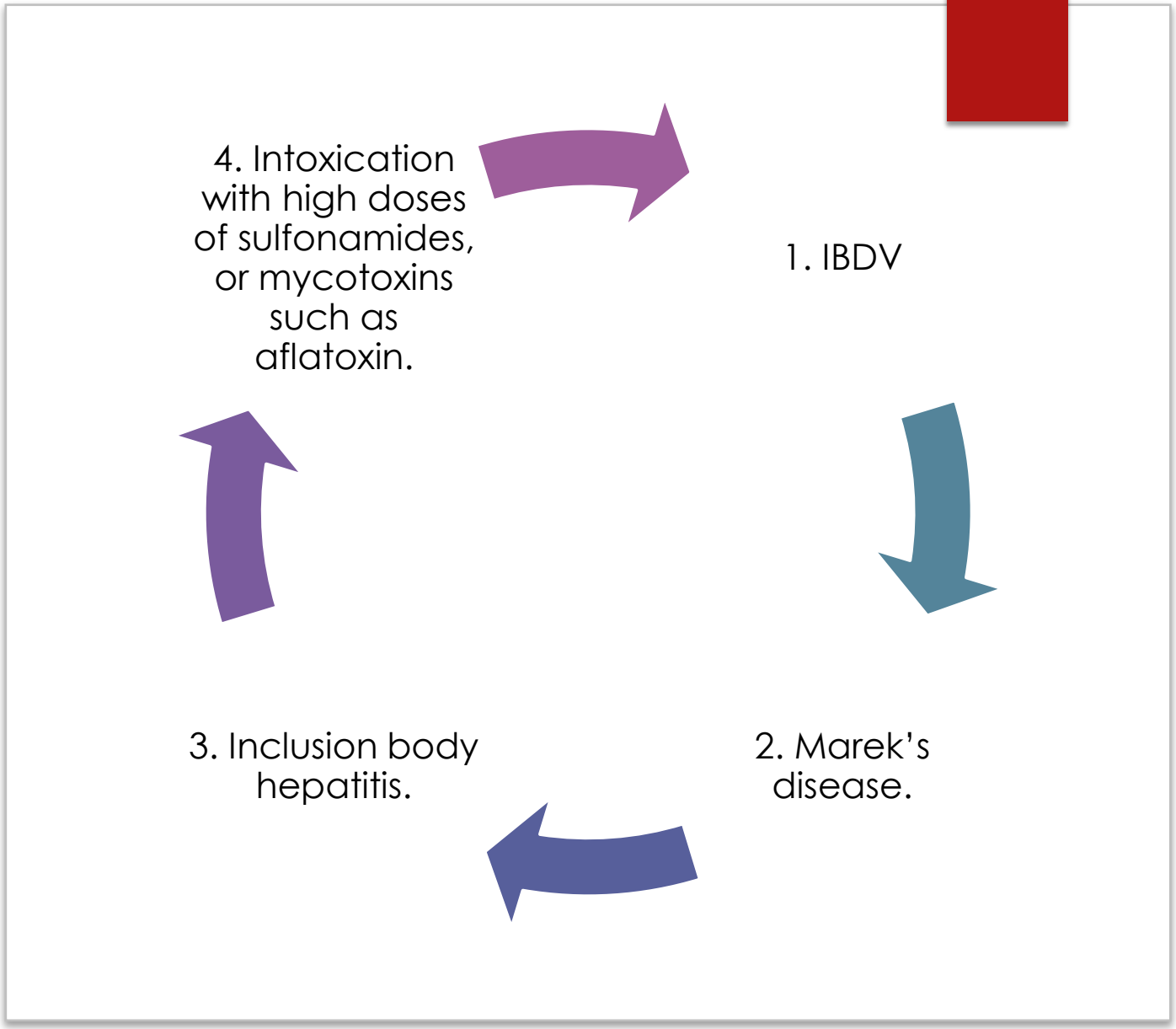
6. In the liver, kidneys, lungs, proventriculus, duodenum, and cecal tonsils, lymphoid foci are depleted of cells

Diagnosis

Isolation and Identification of Causative Agents

- 1. Liver or lymphocytes from the spleen are preferred sources for virus isolation.
- 2. Serology test (virus neutralization and ELISA).
- 3. PCR
- 4. Electron Microscopy
- 5. Immunofluorescence.
- 6. Indirect Fluorescent Antibody Tests.

Differential diagnosis:



Intervention Strategies

Vaccination

Current vaccine strategies are based on the prevention of vertical transmission and horizontal transmission of virus to very young chicks by immunization of breeder flocks and have been successful in reducing the incidence of anemia in young chicks.

Treatment

- No specific treatment for chickens affected by CIAV infection is available. Treatment with broad-spectrum antibiotics to control bacterial infections usually associated with CIA might be indicated.