

## Adenovirus infections

### Virion properties

1. Adenovirus are non-enveloped Double stranded DNA viruses .
2. Adenoviruses are relatively resistant to physical and chemical factors and can remain infective in a contaminated environment.

### Occurrence

Serologic surveys indicated that most poultry flocks have been exposed to infection with one or more adenoviral serotypes. Adenoviruses play a primary or secondary role in a variety of syndromes including **inclusion body hepatitis** and **hepatitis/hydropericardium syndrome** in chickens; **hemorrhagic enteritis** of turkeys; **egg production declines** in laying chickens (egg drop syndrome); **bronchitis** in quail .

## Inclusion body hepatitis (IBH)

### Definition:

Inclusion body hepatitis (IBH) is acute infection disease of young and mature chicken characterized by sudden onset, short course, pathogenic liver change and anemia.

### Etiology:

Most commonly IBH cases involve FAdV8 and FAdV11.

### Epidemiology:

**Distribution** : IBH has a worldwide distribution.

**Hosts** : IBH normally is seen in meat-producing birds.

**Age susceptibility** : It may start in birds as young as 7 days old.

### **Transmission**

1-Virus is present in feces, the tracheal and nasal mucosa, and kidneys. Therefore, virus could be transmitted in all excretions, but highest titers are found in the feces.

2-Vertical transmission is important in the spread of FAdV.

### **Incubation Period**

The incubation period is short (24–48 hours).

## **Morbidity and Mortality**

Morbidity is low. Mortality may reach 10% and occasionally as high as 30%.

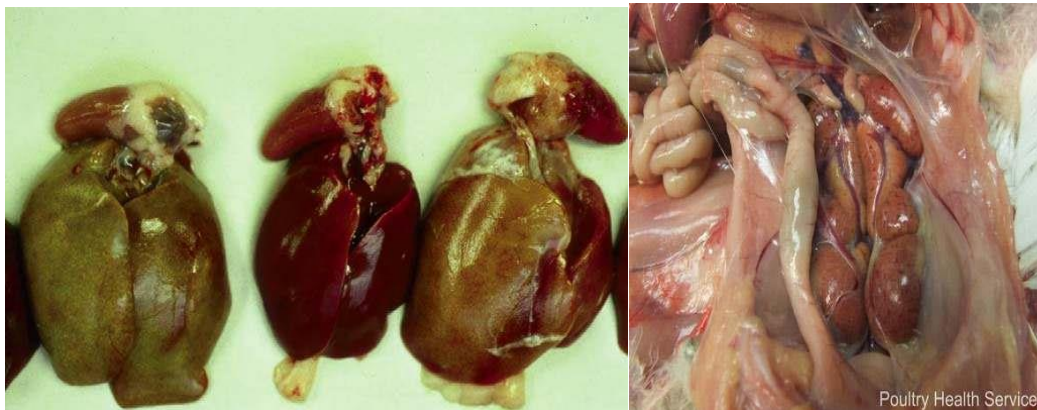
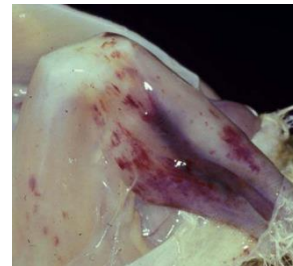
### Clinical signs:

1. A sudden marked increase in mortality is often the first indication of the disease. Mortality increases for 3-5 days and then decreases to normal levels over another 3-5 days.
2. There are few specific signs. There may be pallor of the comb, wattles, and facial skin. The affected birds are depressed .



### Gross lesions:

1. The skin is pale and may be discolored yellow. Petechial hemorrhages may be present in the skeletal muscles of the legs.
2. The liver is swollen, enlarged, yellow and there may be mottling with focal soft areas with petechial hemorrhages .
3. The kidneys frequently are swollen and pale or mottled.



### Diagnosis:

1. In young, growing flocks a sudden increase in mortality is suggestive of IBH. Typical gross lesions and a history of prior outbreaks .
2. Histopathology – Demonstration of typical microscopic lesions in the liver, including the characteristic intranuclear inclusions, is required for a diagnosis of IBH.
3. Virus isolation – Isolation of FAdV from the liver of affected chickens.

4. PCR – detection of FAdV DNA in the liver of affected chickens

#### Control:

1. Because FAdV are effectively transmitted vertically through the embryonating egg, effective control would have to start at primary breeder level.
2. Vaccination of breeders for protection of progeny.

#### Treatment:

Not available.

### **Hepatitis-hydropericardiumsyndrome (Angara disease)**

#### Definition:

Hepatitis / hydropericardium syndrome (HHS), hydropericardium syndrome (HS) or Angara disease.

It is acute infectious disease of chickens characterized by high morbidity and mortality rate, excess pericardial fluid, multifocal hepatic necrosis and it is similar to IBH with higher mortality ranging from 20 to 80% in broilers.

#### Etiology:

FAdV-C virus, serotype 4 (FAdV-4).

Incubation period:- is short (24-48 hr.).

#### Host Susceptibility:

Immature chickens are the natural host and most commonly in 3-5 weeks of age of broiler

#### Morbidity and Mortality:

The disease is similar to IBH with higher mortality ranging from 20 to 80% in broilers.

#### Clinical signs:

1. Hydropericardium syndrome is mainly characterized by rapidly increasing mortality.
2. During the last stages of disease, affected birds exhibit dullness,

depression, ruffled feathers, huddling, ventral recumbency, and closed eyes.

### Gross lesions:

1. A build-up of clear or yellowish brown, thin fluid in the pericardium is the major post-mortem finding of Hydropericardium syndrome.
2. Changes observed in other body organs include discolored and enlarged liver with zones of focal necrosis and hemorrhage, edematous and congested lungs, and pale kidneys with enlarged tubules due to urate deposits.



### Diagnosis:

- 1- Case history.
- 2-clinical signs.
- 3-Gross lesion.
- 4-laboratory test.
- 5-Can be done by histological demonstration of basophilic intranuclear bodies in hepatocytes, it consider highly suggestive of HHS.

### Prevention and Control:-

- 1-Management procedure.
- 2-Vaccination (killed vaccine).

## **Egg drop syndrome**

### Definition:

Egg drop syndrome (EDS) is an infectious disease of laying hens caused by a hemagglutinating adenovirus characterized by loss of color in pigmented eggs and failure to achieve production targets, or by production of thin-shelled or shell-less eggs in otherwise healthy-looking birds.

### Etiology:

EDS is caused by duck adenovirus-1 (DAdV-1) or egg drop syndrome virus which belongs to the genus Atadenovirus.

## Transmission

The EDS virus is mainly spread vertically through the embryonated eggs.

### Clinical signs:

1. The first was loss of color in pigmented eggs, followed by production of thinshelled, soft-shelled or shell-less eggs.
2. The thin-shelled eggs were often rough with sandpaper-like texture or granular roughening of the shell at one end of the egg.
3. The fall in egg production was very rapid or extended over several weeks.
4. EDS outbreak usually lasted 4-10 weeks, and egg production was reduced by up to(40%).
5. Watery albumin has been described.



### Gross lesions:

1. Gross lesions other than inactive ovaries and atrophied oviducts are not seen in natural infections.
2. Edema and swelling of the uterine mucosal folds .



### Diagnosis:

1. Reduction in production with the occurrence of depigmented, soft-shelled eggs in the absence of other clinical signs .
2. Isolation and identification of the virus .
3. The hemagglutination inhibition test in suspect flocks is most helpful immediately after egg changes are observed and ELISA.

### Control:

1. An inactivated vaccine has been successfully used against clinical EDS.
2. Eradication programs can be used to eradicate the disease.