



A Spotlight on Hydropericardium Hepatitis Syndrome (HHS) – An Emerging Illness in Poultry Sector

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<https://doi.org/10.5281/zenodo.8287578>

Hydropericardium hepatitis Syndrome or hydropericardium syndrome (HPS) is an economically important emerging disease in poultry. It is caused by Fowl Adenovirus (FAV) which is linear dsDNA virus. This disease causes heavy mortality among 3-5 weeks old broiler birds and spreads mechanically, vertically and horizontally. IBH-HPS severity is considerably worsened by co-infection with other immunosuppressive viruses, such as IBD, CAV, Marek's Disease virus, etc. Gross examination shows characteristic straw-coloured fluid in pericardial sac, heart appearing like litchi, pale, friable and enlarged liver with minute, petechial or ecchymotic haemorrhages and enlarged kidneys. Histologically presence of intranuclear inclusion bodies in hepatocytes is main pathogonomic lesion of IBH. Clinical findings, necropsy examination and molecular methods like PCR are considered as standards for diagnosis of this disease. For the prevention and control of the disease, proper husbandry procedures, stringent biosecurity measures, and vaccination with an autologous inactivated vaccine are essential.

Introduction

Poultry Industry is one of the fastest growing sectors in India. India is the world's 3rd largest egg producer, 5th largest poultry producer and sixth largest poultry meat producer. Even though it is well established and organised, this sector of the economy nonetheless deals with a lot of acute and severe diseases. The economic impact of the morbidity and mortality caused by infectious and non-infectious diseases in chickens could be severe. One of the most frequent barriers to the expansion of the poultry sector is hepatitis and hydropericardium syndrome, which causes significant financial loss and lower body weight gain.



Aetiology

Hydropericardium hepatitis Syndrome (HHS) or Inclusion Body Hepatitis (IBH) is caused by Fowl Adenovirus, is a member of the family adenoviridae and consists of a non-enveloped capsid icosahedral in shape, measuring 70-90 nm in size and containing a linear dsDNA of approximately 45 kb in size as its genome. Adenoviruses is sub grouped into five species based on their molecular structure and have been further divided into 12 serotypes based on cross-neutralization tests. Among 12 serotypes, serotype 4 has been implicated in HHS.

History And Transmission

In Asia, HPS was first reported in Angara Goth, Karachi, Pakistan with accumulation of straw-coloured fluid in the pericardial sac along with hepatitis and was named as Angara disease. In India, HPS was first reported in the poultry belt of Jammu and Kashmir and Punjab in 1993. This virus can spread both horizontally and vertically. The disease is characterized by sudden onset, reduced productivity, immunodepression and heavy mortality ranging from 20 to 75 per cent in healthy broiler flocks of 2-6 weeks age. FAdV are also transmitted horizontally by oral- faecal route in a flock. Vertical transmission is through eggs from parent birds to progeny is also responsible for its spread.

Pathogenesis And Clinical Signs

The incubation period of around 9 to 15 days is reported of this disease. Duration of this disease is 10-15 days. The quick viraemia that comes from the virus's post-incubation proliferation and causes pathological lesions in its target organs happens concurrently with the clinical manifestation of the illness. The virus, however, is persistently secreted in faeces and dormant in the caecal tonsils. FAdVs have affinity for hepatic cells, endothelial cells as well as lymphoid organs like spleen, thymus, bursa of Fabricius, caecal tonsil etc. resulting in severe immune suppression. The affected chickens show depression, ruffled feathers and resting on the ground with chest, yellow droppings and mortality of around 20-80%.

Gross And Histopathological Changes

Grossly, the characteristic presence of straw-coloured fluid in the pericardial sac with occasional coagulation of fluid giving rise to cloudy appearance to heart. The affected livers are pale, friable, and enlarged with presence of minute necrotic foci and petechiae to ecchymosis haemorrhages. Swollen kidneys, atrophic thymus/ bursa, aplastic bone marrow have been reported. Histological examination of liver reveals the presence of intranuclear inclusion bodies in hepatocytes. In kidney, interstitial lympho-plasmocytic nephritis and glomerulonephritis are observed. In heart, myocarditis,



haemorrhage, mononuclear infiltration has been reported. In spleen, lymphocyte depletion, RE cell proliferation, congestion and haemorrhage are observed.

Prevention And Control

Proper husbandry and biosecurity practises, such as cleaning and disinfecting equipment and premises, preventing guests from entering, providing adequate ventilation and lighting in chicken houses, etc., are the main strategies for the prevention, control, and management of HPS. To improve the overall health of the birds, the diseased flock might be isolated and properly treated with diuretics, liver tonics, haematinics, and vitamin E. Immunization with autogenous inactivated vaccine prepared from prevalent serotype is recommended for prevention and control of disease in particular region. Formalinised inactivated vaccines prepared from HPS isolate propagated in chicken embryo kidney cell has been found to be 100% protective in broiler birds.