

Occurrence of Hydropericardium-Hepatitis Syndrome of Baeksemi and Broiler Raised in Korea

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Abstract

The occurrence of HHS was confirmed for the first time in Korea from chickens submitted for diagnosis to our laboratory from broiler and baeksemi farms. Clinical signs included depression, inappetence, ruffled feathers and a increase in mortality. At necropsy, severe hydropericardium and hepatic necrosis was founded characteristically and the most remarkable microscopic changes were seen in the liver. These included basophilic intranuclear inclusion bodies in the hepatocytes, massive hemorrhages and necrosis in the liver parenchyma. We could also identify fowl adeno-virus(FAV) by polymerase chain reaction(PCR) and electro-microscopic confirmation.

▶ **Abbreviation:** HHS=hydropericardium hepatitis syndrome, EM=electron microscopy, FAV=fowl adenovirus, PCR=polymerase chain reaction

▶ **Key words:** Adenovirus, Baeksemi, Basophilic intranuclear inclusion body, Hepatic necrosis, Hydropericardium

Introduction

Hydropericardium-Hepatitis Syndrome(HHS) in broiler chickens is an acute, infectious disease and characteristically causes severe hydropericardium and multi-focal hepatic necrosis resulting in large economic losses to the broiler industry. Studies at a variety of laboratory have indicated that the causative agent is a fowl adeno-virus(FAV) group I, serotype

4. HHS has been detected in Pakistan, Iraq and some other countries of Asia and America, but not reported in Korea. We could diagnose the disease in three poultry farms located in Ham-yang, Kyung-nam province and Chung-ju, Chung-pook province and Kim-cheon, Kyung-pook province. The chickens were Baeksemis and broilers in the age of 22-day-old, 31-day-old and 30-day-old, respectively.

Materials and Methods

1. Necropsy.

The live or dead birds that submitted to our lab from three poultry farms were necropsied aseptically and gross lesions were recorded.

2. Histopathology.

After a postmortem examination of the chickens, the heart, liver, lungs, spleen, kidney, bursa of Fabricius, thymus were removed and fixed in 10% neutral buffered formalin. All tissue samples were embedded in paraffin and sectioned at 4 μ m, and stained with Hematoxylin and eosin(H&E) and Machiavello's stain for detection of intranuclear inclusion body.

3. Polymerase Chain Reaction(PCR).

Viral DNA was extracted directly from the infected

liver tissues and used as a sample in the PCR to detect the presence of the virus. The primer sequences were as follows:

FAVHR: 5'-GACATGGGGTCGACCTATTTTCGACAT3'-OH

FAVHL: 5'-AGTGATGACGGGACATCAT3'-OH

4. *Electro-microscopic confirmation(EM).*

The morphology of the virus particles within the infected liver cells was studied by EM. EM was conducted at the National Veterinary Research & Quarantine Service, following the standard protocols.

Results

1. *Clinical signs.*

The birds became dull, depressed and debilitated, and showed ruffled feathers, reluctant to move and die.

2. *Gross lesions and histopathology.*

The pericardial sac of affected birds was filled with clear, amber-colored, watery or greenish jelly-like fluid. And the livers showed necrotic foci, hemorrhages and basophilic intranuclear inclusion bodies.

3. *Polymerase Chain Reaction(PCR).*

The PCR was useful for the detection of FAV associated with HHS. The DNA isolated from infected liver tissue was subjected to PCR using FAVH(R) and FAVH(L) primers. As expected, the amplified product was found to be of 0.7kb size

4. *Electro-microscopic confirmation(EM).*

Electron microscopy of purified samples of virus from liver homogenate of affected birds showed virus particles with icosahedral, adenovirus-like particles, and they were hexagonal in appearance. Electron microscopy of liver tissue sections was observed

isometric spherical ovoidal viral particles inside the nucleus of hepatocytes.

Conclusion

We could confirm the HHS from the chickens submitted to our laboratory through the observation of intranuclear inclusion body by histopathological method, the amplified product by PCR and detection of the virus particles by EM. Based on current knowledge, this is the first report of an outbreak of HHS in Korea.

Reference

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