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Pathomorphological diagnosis of Hepatitis-hydropericardium syndrome in poultry: A case report

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Abstract

Hepatitis-hydropericardium syndrome (HHS) is one of the important viral disease of poultry caused by adenoviral infection and its associated with economic losses in poultry industry throughout world. The present study describes cases of HHS in poultry, which was presented for necropsy to the Department of Veterinary Pathology, Khalsa College of Veterinary & Animal Sciences, Amritsar. Grossly, lesions included, pale, friable liver with contained numerous focal to coalescing pale necrotic areas and swollen kidneys with alternating areas of pale and hemorrhagic parenchyma; the bursa of Fabricius was enlarged and edematous. In heart varying degrees of hydropericardium containing clear, straw colored fluid (Pathognomonic lesion) was recorded. The histopathological lesions in the liver congestion, areas of focal hemorrhages and hepatitis. The hepatic cords in majority of the cases were dissociated and moderate number of hepatocytes showed varying degrees of fatty changes and necrotic changes. Based on gross and characteristic microscopic findings, the HHS was diagnosed in poultry.

Keywords: Poultry, hepatitis-hydropericardium syndrome, disease

Introduction

Poultry continues to be one of the top rising segments of the agricultural sector in India nowadays. The development rates of egg production during past 4-6 years for eggs and poultry meat are averaging at nearly 6% and 9% annually, respectively. India's unorganized and backyard poultry sector are also one of the powerful sources for ancillary income generation by many landless/marginal farmers, and also provides nutritional security to the rural poor. There are numerous pathogens which affect the health and productivity of chickens, in turn causing economic losses to poultry industry. HHS is one of the main pathological manifestations and the majority connected with adenoviral infection in poultry [1]. Adenoviral infections are regularly reported among domestic poultry and wild species of birds. However, a few adenoviruses are directly linked with disease conditions and symptoms such as hydropericardium syndrome, inclusion body hepatitis, gizzard erosions, respiratory illness, reduced egg production, enteritis, reduced feed conversion, and retarded growth depending upon the serotypes or genotypes involved [2, 3]. The fowl adenoviruses are diagnosed regularly by isolation of the virus in embryonated chicken eggs or in cell culture, demonstration of virus particles by transmission electron microscope, or by detection of viral genome by polymerase chain reaction [4]. The virus has exaggerated poultry industry globally [3, 1] and in past two decades and during recent years many disease outbreaks have been reported from different regions of India [5, 6, 7].

The present paper describes the cases of hepatitis-hydropericardium syndrome in broiler chicken from Amritsar district regions of different local poultry farms, India and the investigation carried out based on clinical, post-mortem, histopathological examination of affected poultry birds.

Materials and Methods

The dead poultry from Institutional livestock farm complex (ILFC), Khalsa College of Veterinary & Animal Sciences, Amritsar and local poultry farms were presented for postmortem examination to the Department of Veterinary Pathology, Khalsa College of Veterinary & Animal Sciences, Amritsar.

A detailed necropsy was performed and the gross lesions were carefully recorded in affected poultry. Respected tissue samples from the affected organs were collected in 10% neutral buffered formalin for histopathological examination. After fixation in 10% neutral buffered formalin for 24 hours, tissues were washed in running tap water for overnight, dehydrated in ascending grades of alcohol, cleared in xylene and then embedded in paraffin. By using L shaped moulds, rectangular paraffin blocks were made, 5µm thick sections were cut with a semi automatic microtome and then stained with Haematoxylin and Eosin as per the standard procedure [8].

Results and Discussion

Based on history, visual observation of clinical signs and postmortem examination finding, the case was reliably confirmed hepatitis–hydropericardium syndrome (HHS). The necropsy lesions included, pale, friable liver with contained numerous focal to coalescing pale necrotic areas. In heart varying degrees of hydropericardium containing clear, straw colored fluid was recorded (Fig.1). The swollen kidneys and spleen with alternating areas of pale and hemorrhagic parenchyma (Fig.2 and Fig.3), the bursa of Fabricius was enlarged and edematous. The present study, gross lesion was agreement to previous studies [9]. Meenakshi–Bal *et al.* [9] recorded similar gross lesions in necropsied birds pale/icteric, friable, and swollen livers. Liver also contained diffused mutiple pale necrotic areas with petechial or ecchymotic haemorrhages skeletal muscles (thigh and breast muscles).

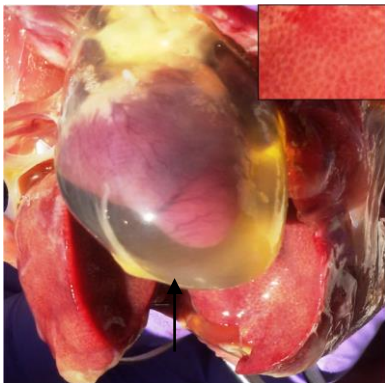


Fig 1: Hepatitis–hydropericardium syndrome in poultry: Enlarged, pale, friable liver with areas of congestion (inset; liver with contained numerous focal to coalescing pale necrotic areas) and pericardial sac containing clear straw colored fluid transudate (arrows).

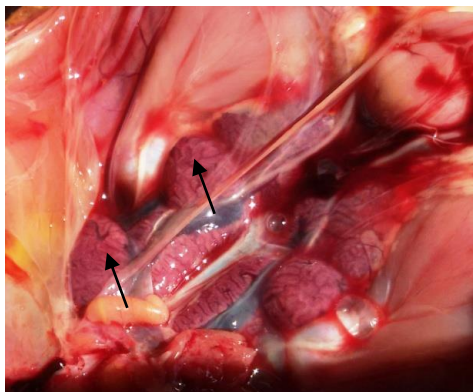


Fig 2: Hepatitis–hydropericardium syndrome in poultry Swollen kidneys with alternating areas of pale and hemorrhagic parenchyma (arrows) of poultry affected with HHS.

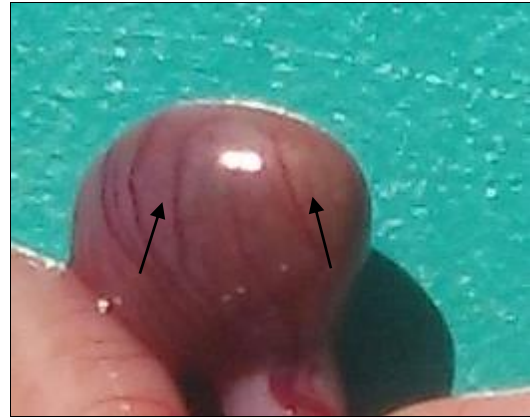


Fig 3: Hepatitis–hydropericardium syndrome in poultry: Enlarged and hemorrhagic parenchyma of spleen of poultry affected with HHS (arrows)

Most of others studies, gross lesions in heart may appear flabby with varying degrees of hydropericardium characterized by presence of a clear straw–coloured fluid (Litchi or Aangara disease) in the pericardial sac. This accumulation of fluid in pericardium may be right side heart failure due to immunosuppressant. In addition, inflammation of kidney, enlarged spleens and thymus atrophy may also be observed in most dead birds by previous workers [10, 11, 12]. Most of these gross lesions were frequently found in all the birds examined, which was presented for necropsy to the Department of Veterinary Pathology, Khalsa College of Veterinary & Animal Sciences, Amritsar. The histopathological lesions in the liver congestion, areas of focal hemorrhages and hepatitis. The hepatic cords in majority of the cases were dissociated and moderate number of hepatocytes showed varying degrees of fatty changes and necrotic changes were similar and consistently in line with the previous reports by various workers [2,12,13,14]. The present study, concluded that gross and histopathological finding in affected poultry with HHS would helpful to diagnosis of disease.

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Competing Interests

The authors declare that they have no competing interests.

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