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Dr. Nayanjyoti Pathak
Department of Veterinary Pathology, Lakhimpur College of Veterinary Science (LCVSc), Assam Agricultural University (AAU), Joyhing, North Lakhimpur, Assam, India

Dr. Biswajit Dutta
Department of Veterinary Pathology, College of Veterinary Science, AAU, Khanapara, Guwahati, Assam, India

Dr. Purabi Deka
Department of Microbiology, College of Veterinary Science, AAU, Khanapara, Guwahati, Assam, India

Dr. Sanjib Khargharia
Department of Pharmacology and Toxicology, LCVSc, AAU, Joyhing, North Lakhimpur, Assam, India

Dr. Pallabi Pathak
Department of Veterinary Parasitology, LCVSc, AAU, Joyhing, North Lakhimpur, Assam, India

Dr. Dwipjyoti Mahanta
Department of Anatomy and Histology, LCVSc, AAU, Joyhing, North Lakhimpur, Assam, India

Dr. Anjan Jyoti Nath
Department of Veterinary Microbiology, LCVSc, AAU, Joyhing, North Lakhimpur, Assam, India

Dr. Aditya Baruah
Department of Veterinary Public Health, LCVSc, AAU, Joyhing, North Lakhimpur, Assam, India

Dr. Manoj Kumar Kalita
Department of ARGO, LCVSc, AAU, Joyhing, North Lakhimpur, Assam, India

Corresponding Author:
Dr. Nayanjyoti Pathak
Department of Veterinary Pathology, Lakhimpur College of Veterinary Science, Assam Agricultural University, Joyhing, North Lakhimpur, Assam, India

Pathology of inclusion body hepatitis-hydropericardium syndrome in a local fowl of Assam

Dr. Nayanjyoti Pathak, Dr. Biswajit Dutta, Dr. Purabi Deka, Dr. Sanjib Khargharia, Dr. Pallabi Pathak, Dr. Dwipjyoti Mahanta, Dr. Anjan Jyoti Nath, Dr. Aditya Baruah and Dr. Manoj Kumar Kalita

Abstract
Inclusion body hepatitis-hydropericardium syndrome (IBH-HPS) is a viral disease caused by group I Adenovirus usually seen in young broilers. Post-mortem examination of a local male fowl aged 3 months was conducted in the Department of Veterinary Pathology, with clinical history of greenish diarrhoea, twisting of neck, anorexia, ruffled feathers, drowsiness etc. Gross lesions were recorded as haemorrhages in the intestine and proventriculus. Liver appeared enlarged and pale in colour with areas of necrosis. Heart showed characteristic hydropericardium lesion due to which it looked like a leechi fruit appearance. Microscopically liver section showed congestion, dilatation of capillaries, degeneration and necrosis of hepatocytes and deposition of fat droplets. There were presence of basophilic intranuclear inclusion bodies in some of the hepatocytes.

Keywords: Inclusion body hepatitis, local fowl, histopathology, Assam

Introduction
Poultry rearing now-a-days is one of the fastest growing and leading industry for both urban as well as rural people. To the national GDP poultry industry contributes 1% and to the Livestock GDP it contributes 14% (Economic Survey, 2021-22) [4]. Though the industry is growing at the rate over 16.8% (20th Livestock Census, 2019) [1], but farmers are not getting profit at the expected level against their efforts which is mainly due to various diseases, managemental conditions, low production performance of desi birds, feed price, lack of scientific knowledge, predation etc. Among the diseases one of the common disease is Inclusion body hepatitis-hydropericardium syndrome (IBH-HPS). Inclusion body hepatitis (IBH) is a viral disease which is usually seen in broilers mostly in young age caused by group I Adenovirus. IBH is similar to Hydropericardium syndrome or Angara disease or Leechi disease. The only difference is that occurrence of hydropericardium and mortality rate are more in Leechi disease (Vegad, 2015) [9]. In the present study a case report was prepared from naturally occurring IBH-HPS in a local fowl of Assam where clinical signs, gross and microscopic changes were recorded from the bird occurred in a farm of Lakhimpur district of Assam.

Materials and Methods
Carcass of a local male fowl aged 3 months was brought to the Department of Veterinary Pathology, Lakhimpur College of Veterinary Science, AAU, Joyhing, North Lakhimpur for post mortem examination with clinical history of symptoms like greenish diarrhoea, twisting of neck, anorexia, drowsiness etc. The farm had a flock strength of 30 birds and the birds were maintained under deep litter system. The carcass was subjected to detailed post-mortem examination and all the visceral organs *viz*. heart, lungs, liver, kidney, intestine, spleen and proventriculus were thoroughly examined. Part of liver where pathological changes were present was collected and preserved in 10% formalin solution for histopathological examination. These formalin fixed tissues were processed routinely and then paraffin embedded tissues were cut at 5 µ thickness and stained with Haematoxylin and Eosin (H & E) stain (Luna, 1968) [7]. Diagnosis was done on the basis of characteristic post-mortem findings and histopathological lesions.

Results and Discussions

As per the history provided by the owner, the clinical signs manifested by the bird were greenish diarrhoea, twisting of neck, anorexia, ruffled feathers, drowsiness and death in the bird. Similar clinical signs were also manifested by some birds in the flock. Similarly, Kumar *et al.* (2013) [6] in a study of inclusion body hepatitis on broiler poultry birds and Ahamad *et al.* (2016) [2] in a study on 8 weeks old Giriraja chicken recorded greenish diarrhoea, dullness, depression, reluctant to move, ruffled feathers etc.

Post-mortem examination of the bird revealed gross lesions as petechial haemorrhages in the intestine and slight haemorrhages in the proventricular gland. Liver was enlarged and pale in colour with the presence of diffuse areas of necrosis (Fig. 1). The typical hydropericardium lesion characterised by accumulation of straw coloured fluid in the pericardial sac of the heart was seen giving the appearance of Indian leechi fruit (Fig. 2). Near about 10 ml clear, straw-coloured fluid could be collected from the pericardial sac. In this regard Vegad and Katiyar (2018) [10] stated that due to the liver damage the albumin production is decreased which leads to hypoproteinaemia in affected birds and this is probably the reason for development of hydropericardium. There was petechial haemorrhages on the epicardium. No abnormalities could be detected in other visceral organs. Similar type of lesions in liver and heart were also described by many previous workers (Ahamad *et al.*, 2016; Dutta *et al.*, 2017 and El-Shall *et al.*, 2022) [2, 3, 5].

Histopathological observations from the liver section showed congestion and dilatation of capillaries (Fig. 3), dilatation of sinusoids (Fig 4), degeneration and necrosis of hepatocytes and deposition of varying sizes fat droplets (Fig. 5). These fat droplets sometimes pussing the nucleas to the periphery. In some of the hepatocytes there was basophilic intranuclear inclusion bodies (Fig. 6). These lesions were almost in accordance with the observations of Nakamura *et al.* (2011) [8], Ahamad *et al.* (2016) [2] and Dutta *et al.* (2017) [3].

Based on the clinical signs, characteristics gross and histopathological findings in the affected organs the case was diagnosed as Inclusion body hepatitis-hydropericardium syndrome (IBH-HPS).

Fig 1: Enlarged and pale liver with diffuse areas of necrosis

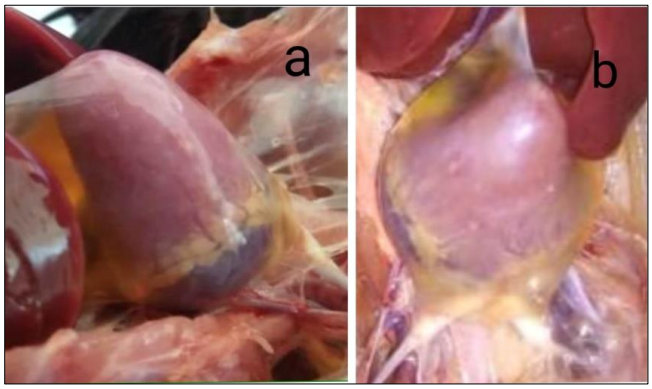

Fig 2 (a, b): Hydropericardium

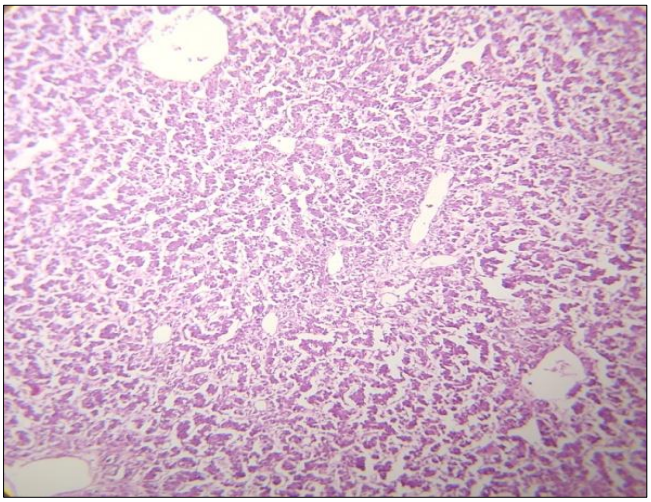

Fig 3: Liver showing congestion and dilatation of capillaries (H&E X10)

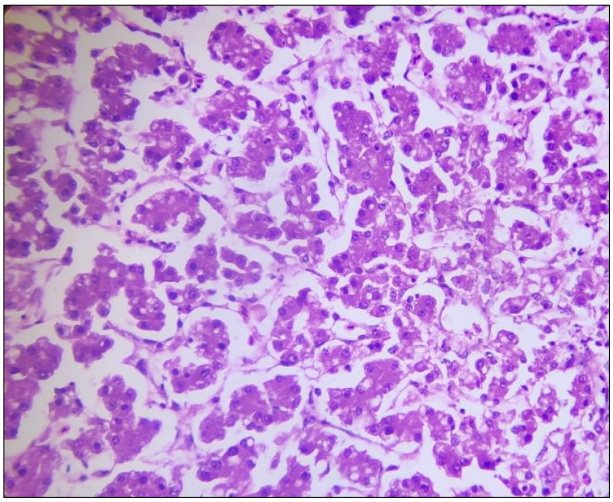

Fig 4: Liver showing dilatation of sinusoids (H&E X40)

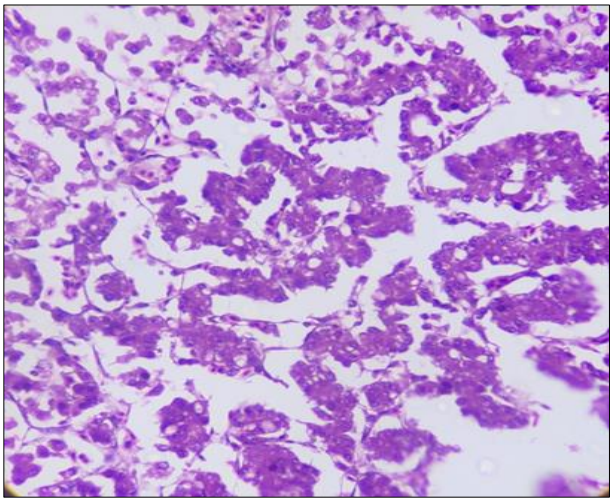

Fig 5: Fatty degeneration and necrosis of hepatocytes (H&E X40)

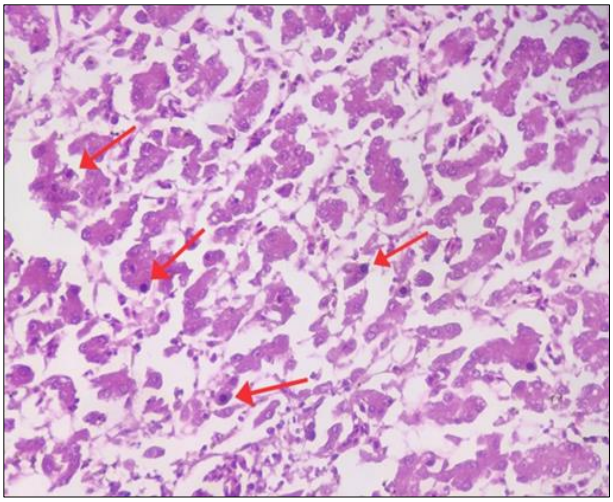

Fig 6: Hepatocytes showing basophilic intranuclear inclusion bodies (Arrow) (H&E X40)

Conclusion

Though IBH-HPS is mostly a disease of young broilers but local fowls also can get the infection. Therefore, farmers can follow proper vaccination schedule for local birds too. Again through characteristic gross and microscopic examination we can diagnose a case of IBH-HPS.

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