CLINICO-PATHOLOGICAL ALTERATIONS IN A CASE OF BOVINE (ANAPLASMOSIS)

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ABSTRACT

A five-year-old Holstein Friesian cow was presented to Teaching Veterinary Clinical Complex, College of Veterinary Science, GADVASU, Ludhiana with a history of tick infestation and high fever. Hematological examination revealed severe Anaplasma marginale infection with reduction in hemoglobin (2 gm/dl), total erythrocyte count (1x10^6 cells/cu mm) and packed cell volume (6%) with absolute neutrophilia and highly activated platelets. The animal died the next day and was sent for post mortem examination. Grossly the carcass was anemic and icteric. There was enlargement of spleen and petechial hemorrhages on heart and kidney. Histopathologically spleen showed lymphoid depletion and hemosiderosis. Kidney revealed tubular degeneration and necrosis besides interstitial hemorrhages. Fatty changes and mild hemorrhages besides biliary retention were observed in liver. Myocardial hemorrhages were also evident.

Key Words: Anaplasma marginale, Hemoglobin, Hemosiderosis, Neutrophilia.

Anaplasmosis is an infectious, non-contagious, tick borne disease of domesticated and wild ruminants caused by obligate intraerythrocytic parasites of the order Rickettsiales, genus Anaplasma (Radostitis et al, 2000). Anaplasmosis occurs in tropical and subtropical regions worldwide. Bovine anaplasmosis is of economic significance as far as the cattle farming is concerned (Smith, 1996). The present study reports the clinicopathological alterations in Holstein Friesian cattle that died due to anaplasmosis.

A five-year-old Holstein Friesian cow was presented to Teaching Veterinary Clinical Complex, College of Veterinary Science, GADVASU, Ludhiana with a history of tick infestation and high fever (105°F). Blood sample drawn from the cattle and processed for various hematological parameters viz. hemoglobin, packed cell volume, total erythrocyte count, total leukocytic count, and differential leukocytic count as per the standard protocols (Benjamin, 2007). The animal died the next day and was sent for post mortem examination. A thorough necropsy was undertaken and representative tissue samples from the liver, spleen, kidney, heart and intestine were immediately collected in 10% neutral buffered formalin. Tissue samples were processed for routine hematoxylin and eosin staining as per the standard protocol Luna (1968).

Hematological findings of the cattle revealed regenerative microcytic hypochromic anemia with mild to moderate anisocytosis. Most the erythrocytes were infected with the Anaplasma marginale (Fig.1). Platelets were highly activated, although the count was within normal range (2.65x10^5 cells/cu mm). Total Erythrocyte count (1x10^6 cells/cu mm), packed cell volume (6%) and hemoglobin count (2 gm/dl) were drastically reduced. Total leukocytic count (10.5x10^3 cell/cu mm) was within normal range with increased neutrophils (64%) i.e. absolute neutrophilia. The haematological alterations observed were in accordance with Alfonso et al, (1996), who studied anaplasmosis in experimentally infected calves.

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The carcass of cattle was markedly anaemic and icteric (Fig. 2). Blood was thin and watery. The spleen was characteristically enlarged and soft, with prominent follicles. The liver showed mottling and yellowish discoloration. The gallbladder was distended with thick brownish yellow bile. Heart and kidney revealed only mild to moderate petechial hemorrhages. Microscopically, spleen showed lymphoid depletion and widespread of erythrocytes as evident by increased haemosiderosis in spleen (Fig. 3). Kidney revealed tubular degeneration and necrosis besides interstitial hemorrhages (Fig. 4). Liver showed fatty changes and mild hemorrhages besides biliary retention (Fig. 5). Myocardial hemorrhages were also evident.

Anaplasmosis is not contagious. Transmission may occur via 20 species of tick vectors and mechanically by contaminated needles or dehorning or other surgical instruments. There is a strong correlation between age of cattle and severity of disease as adults are more susceptible to the infection (Radostitis et al, 2000). Although, Anaplasma marginale is mainly the parasite of cattle,
other species of this genus also cause anaplasmosis in bovines and can lead to death due to severe anaemia in bovines (Kuttler, 1984). In the present case, the adult Holstein Friesian cow infected with the *A. marginale* parasite and from clinicopathological studies, it was concluded that the death might have been due to severe anemia, subsequent hypoxia and death.

**REFERENCES**