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PATHOLOGICAL STUDIES ON RABBIT HEMORRHAGIC DISEASE (RHD)
IN YOUNG RABBITS WITH EMPHASIS ON HEPATIC LESIONS

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Rabbit hemorrhagic disease (RHD) is an acute, contagious, and highly fatal viral disease of wild and domestic adult rabbits. Morphologic changes characteristic of marked necrotizing hepatitis and disseminated intravascular coagulation (DIC) are common in adult rabbits that die of acute RHD. However, there are no detailed reports on the occurrence of this disease in young rabbits. In this study, twenty young rabbits (2 and 4 weeks of age) were experimentally infected with rabbit hemorrhagic disease virus (RHDV), sacrificed, and examined chronologically up to 96 hours post-inoculation (PI). Another group of 4-week-old rabbits was also infected with RHDV and observed for 9 weeks PI. Half of these were reinoculated with RHDV, and 1 week later they were euthanatized and exsanguinated.

None of the inoculated rabbits showed clinical signs of disease and there was no mortality. At necropsy, significant gross abnormalities were limited to the liver and consisted of scattered small gray spots in the hepatic parenchyma. Microscopically, these foci consisted of aggregates of lymphocytes, RES cells and heterophils with or without accompanying hepatocellular degeneration or necrosis and the presence of acidophilic bodies. Focal necrosis, solitary degenerated hepatocytes or single cell necrosis of hepatocytes were also seen with occasional infiltration of lymphocytes and heterophils. These lesions were considered to be a consequence of direct destruction of hepatocytes following a reproductive infection by RHDV, and partly due to a cytotoxic reaction. In the healing stage, small fibrotic foci were seen in the rabbits and these were observed till 9 to 10 weeks PI. Immunohistochemical analysis demonstrated the presence of viral antigen in the cytoplasm and nuclei of the degenerated or necrotic hepatocytes, and in the cytoplasm of the RES cells within the cellular aggregates. The hemagglutination-inhibition (HI) titers of the rabbits observed up to 9 or 10 weeks PI were measured. Titers began to rise 3 days PI and remained at high levels till 9 weeks.

In conclusion, it was demonstrated that there were mild lesions in the livers of young rabbits inoculated with RHDV although the infection was subclinical. The resistance of young rabbits to RHD was considered to be due to low susceptibility of hepatocytes to RHDV and partly due to the presence of serum antibodies against RHDV.