PATHOLOGICAL STUDY ON FETUSES EXPERIMENTALLY INFECTED WITH CANINE PARVOVIRUS TYPE 1

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The present study was designed to establish the pathogenesis of canine parvovirus type 1 (minute virus of canines; MVC) infection in dog fetuses. MVC was inoculated into the amniotic sac of fetuses of three dogs at various stages of pregnancy (35th day, 45th day and 50th day). This resulted in the deaths of some of the fetuses at 14 days postinoculation (PI), after which they were subjected to necropsy. Grossly, there were no remarkable lesions in the organs examined. Predominant histological lesions caused by MVC were seen in the lung and small intestine and there was variation in the severity of lesions among fetuses.

In the lungs, there was interstitial pneumonia characterized by hypertrophy and hyperplasia of alveolar-type cells and there were a few intranuclear viral inclusions in them. The alveoli contained a few desquamated cells and in intrapulmonary bronchi there were hypertrophy and hyperplasia of the mucosal epithelial cells, some of which contained intranuclear viral inclusions. The lesions in the small intestine consisted of intranuclear viral inclusions in the mucosal epithelial cells extending from the crypt to the tip of the villous with severe cryptitis. These lesions were different from those caused by parvovirus infection in dogs and cats. Intranuclear viral inclusions were also seen in the mucosal epithelial cells of the large intestine and the acinar cells of the pancreas. Immunohistochemical examination revealed MVC antigens as small brown homogeneous masses consistent with the intranuclear viral inclusions in the lung and intestine.

MVC multiplies preferentially in the nuclei of actively dividing cells, inhibiting protein synthesis by host cells. Hence the effects of infection are greatest in cells with a high mitotic rate, including a variety of tissues during organogenesis in the fetus. MVC does not seem to be widespread in the dog population in Japan. However, the results of this study indicate that MVC is able to cause lesions in fetuses and must be considered as a cause of fetal deaths in dogs.