Canine parvovirus type-1 (MVC): Pathomorphological studies on the experimentally infected fetus and MVC-infected cultured cells (14-Aug-1999)

A. Hashimoto

Dept. of Veterinary Clinical Sciences, Graduate School of Veterinary Medicine, Hokkaido University, Sapporo, Japan.

Abstract

Canine parvovirus type 1 (CPV-1), named the minute virus of canines (MVC), is antigenically distinct from canine parvovirus type 2 (CPV-2). Studies on seroprevalence of MVC suggests it is widespread in canine populations in North America. Limited serological study also shows presence of MVC in Japan. MVC now appears to be established as a cause of illness in neonatal pups and of transplacental infection with embryonic/fetal death. Principal histopathologic lesions in infected pups and fetuses are observed in the lung, small intestine and lymph nodes. Pathogenicity studies of MVC for dogs seems important to define its role in canine disease.

In this presentation, we report additional histopathologic findings of the fetuses experimentally infected with MVC and the results of the study on the morphologic characterization of MVC-infected cultured cell.

In our first experiment, MVC was inoculated into the amniotic sac of fetuses of 3 pregnant dogs at various stage of gestation. Twenty-one fetuses obtained from 3 dogs were subjected to histopathologic examination. Predominant histopathologic lesions were observed in the lung and small intestine. There was interstitial pneumonia characterized by hypertrophy and hyperplasia of alveolar type cells and the presence of intranuclear inclusion bodies (IIB) in them. The lesions in the small intestine consisted of the presence of IIB in the mucosal epithelial cells extending from the crypt to the tip of the villous with severe cryptitis. IIB were also found in the mucosal epithelial cells of the large intestine and acinar cells of the pancreas. These findings suggest that MVC may affect a variety of tissues during organogenesis in the fetus.

In the second experiment, morphological characteristics of the Walter Reed Canine Cell (WRCC) infected with MVC were examined and compared with those of other types of parvoviruses. In addition, the procedures of immunofluorescence (IF) and in situ hybridization (ISH) were examined to establish a reliable diagnostic method of MVC infection in the laboratory. Results of microscopic and ultrastructural observation of IIB were similar to structure of IIB of cells infected with another type of parvovirus. Furthermore, ISH showed higher sensitivity than IF to detect the virus infection.

Results obtained from the present experiments may be useful to elucidate the pathogenicity of MVC.

All rights reserved. This document is available on-line at www.ivis.org. Document No. P0127.0899.