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AN IMMUNOHISTOCHEMICAL APPROACH TO THE PATHOGENESIS OF DIARRHEA IN FELINE PANLEUKOPENIA

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An immunohistochemical study was carried out to investigate the pathogenesis of diarrhea in feline panleukopenia (FPL). FPL was experimentally induced by inoculating kittens serologically negative for FPL virus (FPLV) with FPLV. Pathological examination was made with special reference to the small intestinal immune system relating to the onset of diarrhea.

The jejunum, ileum, mesenteric lymph nodes, spleen and thymus were taken from the kittens induced with FPLV, and were submitted for this study. In addition to histopathology, morphometry and immunohistochemistry for cytoplasmic IgM and IgA (cIgM, cIgA) were performed to examine numerical changes in Ig-secreting cells in the jejunum, ileum and mesenteric lymph nodes. Immunohistochemistry for FPLV antigen was also performed to detect the antigen.

Of 32 infected kittens, 10 showed clinical signs of diarrhea 4~7 days post-inoculation (DPI) (symptomatic group) and 9 did not (asymptomatic group). The other 13 cases developed diarrhea 1~3 DPI and were classified as the "early infection group".

The cIgM or cIgA positive cells decreased in number in all of the jejunum, ileum, and mesenteric lymph nodes. This was more prominent in the jejunum and ileum of the symptomatic group.

FPLV antigen coinciding with intranuclear inclusion bodies on sections stained with hematoxylin-eosin was detected from 2 DPI in lymphoid cells of the white pulp of the spleen, cortex of the mesenteric lymph nodes, lamina propria of the jejunum and ileum, and cortex of the thymus. Double positive cells for surface IgM and FPLV antigen were also observed in the Peyer's patches.

As to the pathogenesis of FPL, diarrhea has been reported as being caused by tissue invasions of enterobacteria through the crypt epithelia destroyed by FPLV. The decrease in the number of Ig-secreting cells in the present study may provide more opportunity for the adherence of enterobacteria to the surface of the intestinal mucosa.

In addition, FPLV antigen was detected in lymphoblasts of the lymphoid tissue and organs examined. These findings suggest that a decrease in the number of Ig-secreting cells in the lamina propria of the small intestine might result from the disintegration of the precursor cells by FPLV during plasma cell differentiation.