

Caspase-3/-8/-9, Bax and Bcl-2 expression in the cerebellum, lymph nodes and leukocytes of dogs naturally infected with canine distemper virus

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ABSTRACT. Canine distemper is an immunosuppressive disease caused by the canine distemper virus (CDV). Pathogenesis mainly involves the central nervous system and immunosuppression. Dogs naturally infected with CDV develop apoptotic cells in lymphoid tissues and the cerebellum, but this apoptotic mechanism is not well characterized. To better understand this process, we evaluated the expression of Bax, Bcl-2, and caspase-3, -8 and -9, by evaluating mRNA levels in the peripheral blood, lymph nodes and cerebellum of CDV-infected (CDV+) and uninfected (CDV-) dogs by real-time polymerase chain reaction (PCR). Blood samples from 12 CDV+ and 8 CDV- dogs, diagnosed by reverse transcription-PCR, were subjected to hematological analysis and apoptotic gene expression was evaluated using real-time-PCR. Tissues

from the cerebellum and lymph nodes of four CDV+ and three CDV- dogs were also subjected to real time-PCR. No significant differences were found between CDV+ and CDV- dogs in the hemotological results or in the expression of caspase-3, -8, -9, Bax, and Bcl-2 in the peripheral blood. However, expression of Bax, caspase-3, -8 and -9 was significantly higher in the cerebellum of CDV+ compared to CDV- dogs. Expression of caspase-3 and -8 was significantly higher in the lymph nodes of CDV+ compared to CDV- dogs. We concluded that infection with CDV induces apoptosis in the cerebellum and lymph nodes in different ways. Lymph node apoptosis apparently occurs via caspase-3 activation, through the caspase-8 pathway, and cerebellum apoptosis apparently occurs via caspase-3 activation, through the caspase-8 and mitochondrial pathways.

Key words: Apoptosis; Canine distemper virus; Caspases; Cerebellum; Lymph nodes; Real-time PCR