Colonic lymphocyte and plasma cell populations in dogs with lymphocytic-plasmacytic colitis

Albert E. Jergens, DVM, MS; Yvan Gamet, DMV; Frances M. Moore, DVM; Yosiya Niyo, DVM, PhD; Claire Tsao, MS; Becky Smith

Objectives—To quantitate immunoglobulin-containing cells (IgA, IgG, and IgM) and CD3+ T cells in colonic biopsy specimens obtained from dogs with lymphocytic-plasmacytic colitis (LPC), and to compare lymphocyte and plasma cell populations in dogs with LPC with those in healthy dogs.

Animals—10 healthy dogs and 11 dogs with LPC.

Procedure—Colonic mucosal specimens obtained from healthy dogs and dogs with LPC were stained specifically for IgA-, IgG-, and IgM-containing cells and CD3+ T cells by use of immunoperoxidase techniques. Morphometric analyses were done to quantitate lymphocytes and plasma cells in standardized areas of colonic mucosa. Data analyses allowed determination of mean cell numbers in each dog group, and comparison of mean numbers of lymphocytes and plasma cells between dog groups.

Results—CD3+ T cells predominated in healthy dogs, whereas CD3+ T cells and IgA-containing cells were most numerous in dogs with LPC. In both dog groups, the IgG- and IgM-containing cells were considerably less numerous than the other 2 cell types. Comparison of cell populations between dog groups indicated that IgA- and IgG-containing cells and CD3+ T cells were significantly more numerous in the colonic mucosa of dogs with LPC.

Conclusions—Dogs with LPC have significantly increased numbers of IgA- and IgG-containing cells and CD3+ T cells. These lymphocyte and plasma cell distributions indicate similarities to and differences from such distributions in human beings with inflammatory bowel disease. Results provide a basis for future correlation between histologic stage of disease activity and immunologic findings in dogs with LPC. (*Am J Vet Res* 1999;60:515–520)

In dogs, **inflammatory bowel disease (IBD)** denotes a spectrum of chronic, inflammatory disorders of the gastrointestinal tract of unknown cause and pathogenesis.[1,2] **Lymphocytic-plasmacytic colitis (LPC)** is a classification of IBD that is considered the most common inflammatory colonic disease in dogs.[3-6] Morphologically, histologic lesions are characterized by mucosal epithelial-glandular alterations and a variably increased mucosal cellular infiltrate of lymphocytes and plasma cells, which indicates an immunologic mechanism in this disease.[1-8]

Imbalances in the density and proportions of colonic lymphocyte and plasma cell populations have been associated with IBD (ulcerative colitis and Crohn's disease) in human beings.[9-16] Quantitative studies generally have indicated increases in all 3 major classes of immunoglobulin-containing cells in chronic idiopathic IBD[9-14] or of IgG-containing cells in ulcerative colitis,[15] increases of IgG- and IgM-containing cells in active Crohn's disease, and a relative increase of IgM-containing cells in quiescent Crohn's disease.[10] Mucosal alterations in some T-cell subsets have also been observed in human beings with IBD.[16] To the authors' knowledge, comparative data for immunoglobulin-containing cells and T cells in dogs with LPC (as well as other histologic forms of colonic IBD) have not been published.

Definition of the numbers and distribution of immunoglobulin-containing cells and T cells in colonic tissue of dogs with LPC may provide new insights concerning the immunopathologic characteristics of IBD. The purposes of the study reported here were to quantitate morphometrically the numbers of IgA-, IgG-, and IgM-containing cells and CD3+ T cells in colonic biopsy specimens obtained endoscopically from dogs with LPC, and to compare lymphocyte and plasma cell populations in dogs with LPC with those observed in healthy dogs.

Materials and Methods

Dogs—Colonic tissue specimens were obtained from 21 dogs. All tissues were reviewed by 2 pathologists, and healthy and diseased dogs were classified into 2 groups on the basis of clinical and histologic criteria.

Group 1 consisted of 10 adult, mixed-breed dogs of random-source origin. Tissues from 7 of these dogs had been previously used for determination of reference values of colonic B and T cells,[17] and the control group reported here was expanded by the addition of 3 more dogs. Each dog was judged healthy on the basis of results of physical examination and thorough prebiopsy laboratory evaluation (CBC, serum biochemical analysis, urinalysis, and negative results of 3 fecal examinations [by use of zinc sulfate centrifugal flotation techniques, and after prophylactic deworming with fenbendazole at a dosage of 50 mg/kg of body weight, PO, given once daily for 3 days] for parasitic ova and *Giardia* sp). All dogs were fed a balanced, commercial canine maintenance ration[a] and allowed ad libitum access to water for 4 weeks prior to colonoscopy. None of the dogs had large bowel diarrhea or other signs of gastrointestinal tract dysfunction, and results of biopsy were interpreted as normal.

Group 2 comprised 11 dogs with a diagnosis of LPC, according to published criteria.[7] Briefly, criteria for selection

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From the Departments of Veterinary Clinical Sciences (Jergens, Gamet) and Veterinary Pathology (Niyo, Smith), College of Veterinary Medicine, and the Department of Statistics, College of Liberal Arts and Sciences (Tsao), Iowa State University, Ames, IA 50011; and Veterinary Division, Marshfield Laboratories, Marshfield, WI 54449-5795 (Moore). Dr. Gamet's present address is Quartier Croc de la Mure-Uchaux, 84100 Orange, France.
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