

Canine Inflammatory Bowel Disease

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Introduction

Inflammatory bowel disease, or IBD, is characterized by chronic inflammation of the gastrointestinal mucosa. There are various types of IBD, each classified by the anatomic location and cell type involved. There are four common types of IBD. The most common form is lymphocytic-plasmacytic enteritis closely followed by eosinophilic enteritis. Other forms, including neutrophilic, and granulomatous IBD exist, but are not as common in animals.^{2-3,6} There is no straightforward approach to diagnose IBD, and it is often diagnosed by exclusion of other diseases. Diagnosis is typically made from history, clinical signs, and possibly intestinal biopsies. Recent studies have used a scoring index with six criteria that must be met in order to diagnose a dog with IBD.²⁻⁶

History and Presentation

Most dogs diagnosed with inflammatory bowel disease are middle aged to older, with the average age being 5-6 years old.² Certain breeds are genetically predisposed to certain types of IBD. For example, Basenjis are predisposed to immunoproliferative small intestinal diseases, Lundehunds to protein-losing enteropathy and lymphangiectasia, and soft-coated wheaten terriers to protein-losing enteropathy.^{4,6}

Clinical signs vary with the severity of inflammation. Dogs with mild inflammation typically exhibit intermittent signs in comparison to dogs with severe inflammation who have persistent and progressive clinical signs. Dogs initially present with progressive weight loss, diarrhea, intermittent vomiting, and/or abdominal pain.^{2-4,6}

Additional clinical signs help localize the site of inflammation. Frequent episodes of diarrhea with mucus suggest lower small intestine (enteritis) or large intestine (colitis)

inflammation. Animals with colitis tend to maintain a healthy appetite and don't lose weight. Vomiting and weight loss indicate inflammation in the upper small intestine or stomach (gastritis). Vomitus in dogs with gastritis may contain partially digested or undigested food material or bile. In addition to weight loss and vomiting, dogs with enteritis may have large volumes of diarrhea.^{2,6} Although IBD can affect the stomach, small intestines, and/or large intestines, the small intestine is the most commonly affected site. Dogs with small intestine or stomach IBD tend to lose weight due to lack of nutrient absorption and become depressed or lethargic over time.^{2,3,6}

Pathophysiology

Inflammatory bowel disease is characterized by chronic inflammation of the gastrointestinal mucosa. The exact cause of the inflammation is not well understood, but research has produced several likely theories. It is believed to be an immune-mediated disease where genetics may play a role. Diet and environment also appear to be a part of IBD. Normal diets include larger protein molecules. It is also believed that dogs with IBD produce an adverse immune response to the protein leading to inflammation of the gastrointestinal mucosa.^{3,4,6}

Lymphocytic-plasmacytic enteritis is the most common cellular type of IBD. With this form, lymphocytes and plasmacytes are the predominant cells seen histologically and may cause changes to the intestinal mucosa. This form may lead to lymphangiectasia and protein-losing enteropathy. The eosinophilic form is characterized by the presence of eosinophils in the mucosa. It is not as common as the lymphocytic-plasmacytic form, but is much more severe. Neutrophilic and granulomatous forms are

rarely seen in animals and are characterized by an increase in neutrophils or histiocytes and macrophages respectively.^{2,6}

Differential Diagnosis

Due to the varying clinical signs of inflammatory bowel disease, several other diseases must be ruled out before IBD can be diagnosed. Pancreatitis, parasites such as *Giardia* and hookworm, foreign bodies, lymphangiectasia, intussusception, lymphoma, chronic kidney or liver disease, and pancreatic insufficiency all produce gastrointestinal signs and are considered differential diagnoses. Most conditions do not cause inflammation; however, adverse reactions to food and antibiotic-responsive diarrhea will have inflammation. To rule out these, diet change or antibiotic therapy should be included for several weeks without immunosuppressing the animal. Response to therapy can help eliminate IBD as the diagnosis.⁶

Diagnostic Approach/Considerations

A standardized clinical scoring system has been implemented to diagnose and evaluate severity of IBD in dogs. The canine inflammatory bowel disease activity index, CIBDAI, uses quantifiable and repeatable measures to score individual patients based on their clinical signs. This index measures 6 major clinical signs including attitude, appetite, vomiting, stool consistency, stool frequency, and weight loss and is scored 0 to 3. The total score is used to classify the disease as insignificant (0-3), mild (4-5), moderate (6-8), or severe (>9).^{2-4,6}

Canine C-reactive protein is an acute phase reactant protein that increases with inflammatory disease. It is an excellent marker for inflammation occurring with IBD and typically correlates with CIBDAI scores. Higher CRP levels are seen in animals with high CIBDAI scores. Serum CRP should be assessed each time a dog is scored as a prognostic indicator.^{1-4,6} CRP cannot be used alone as other gastrointestinal diseases such as pancreatitis may increase serum CRP levels.

Radiographs and ultrasound can be used to rule out obstruction, masses, intussusception, and to evaluate the thickness of the intestinal wall.⁶ Unlike other species, including humans, intestinal wall thickness is not an accurate way to diagnose IBD. Because of this inaccuracy, radiographs and abdominal ultrasound must be used in addition to other modalities.^{2-4,6}

A complete blood count and blood chemistry can help detect an underlying disease as the cause of clinical signs rather than a gastrointestinal cause. Gastrointestinal disease is characterized by hypoproteinemia, hypocalcemia, hypocholesterolemia, hypoalbuminemia, hypocobalaminemia, and leukopenia/leukocytosis.⁶ Cobalamin is absorbed in the ileum so a hypocobalaminemia localizes gastrointestinal disease to the ileum indicating damage to the ileal mucosa.^{2,6}

Fecal analysis is a simple initial test performed and is used to rule out giardia and other intestinal parasites as the cause for diarrhea.⁶

Intestinal biopsies via endoscopy are recommended for patients with hypoalbuminemia in addition to diarrhea/vomiting, weight loss, and decreased appetite. Endoscopic biopsies are considered the gold standard of IBD diagnosis and provide a definitive diagnosis when used with other tests. Histological severity usually correlates

with CIBDAI scores and CRP levels. A standardized histologic grading system based on the level of disruption of the mucosal epithelium has been created.^{2-4,6} Lesions for mild IBD with no mucosal disruption include glandular necrosis, fibrosis of lamina propria, and immaturity. Histologic changes with severe IBD have mucosal disruption including necrosis, villus atrophy, and ulceration. Histologic evaluation of samples identifies the prominent cell type involved. A study performed by Garcia-Sancho et al. showed that histological evaluation was only relevant for diagnosis and to assess severity of IBD. Animals receiving treatment and those in remission did not have any histologic improvement from initial biopsies.⁴ A disadvantage of histologic evaluation is that there is no standardized approach to obtaining samples or pathologist training. Results and diagnosis may vary due to subjectivity of the pathologist.^{3,4,6} Another advantage of endoscopy is visualization of the stomach and intestinal mucosa. Visualization may aid in the diagnosis of IBD, ulceration, or lymphangiectasia.

Diagnosis of IBD is typically made using 4 criteria: chronic GI signs, histologic inflammation, eliminating other causes of GI signs or inflammation, and a positive response to appropriate therapy.⁴

Treatment and Management Options

The initial treatment for IBD is a food trial using a hypoallergenic hydrolyzed protein diet. Recent studies show that diet change alone resulted in a 50% response rate.⁶ These diets use smaller sized proteins to eliminate an immune response. A hydrolyzed protein diet for the remainder of the dog's life will help achieve remission for longer. In more severe cases immunosuppressive steroids were required in addition to diet change.

In most cases, immunosuppressive doses of steroids were necessary in controlling the clinical signs associated with IBD.⁵⁻⁶ Unfortunately, high doses of steroids produce adverse effects including polyuria, polydipsia, and obesity.² Initially, animals are placed on high doses of steroids and the dose is tapered gradually until the lowest dose with no gastrointestinal signs is reached. The efficacy of adding an antibiotic such as metronidazole has been debated. A study performed by Munster et al. concludes that adding antibiotic therapy to diet change and steroids was questionable. It also concluded that diet change alone saw most dogs going into remission.⁵ Another study concluded that while antibiotics with steroids achieved a decrease in clinical signs sooner, it didn't decrease the number of flare ups over a longer period of time. However, antibiotics reduce the number of bacteria in the GI, controlling the population of pathologic colonies that may increase inflammation.³⁻⁶

Expected Outcome and Prognosis

Inflammatory bowel disease is not a curable disease, but it is a manageable one. Prognosis for IBD varies. The type of IBD may determine long term prognosis. The lymphocytic-plasmacytic form has the best prognosis and long term remission is more likely. As clinical signs decrease, CIBDAI and CRP values should decrease with effective treatment. Dogs with a high initial CIBDAI score and a high CRP level are not as likely to go into remission and have a poorer prognosis than those with low scores. Hypoalbuminemia has been considered a poor prognostic indicator.^{3,4,6}

Conclusion

Inflammatory bowel disease is a frustrating and difficult disease to diagnose. It involves a tedious process of ruling out other diseases before reaching a diagnosis. IBD is not a treatable condition, but with appropriate therapy it can easily be managed and remission can be achieved. While complete remission may not be possible in severe cases, dogs with mild histologic changes and clinical signs can achieve remission and live fairly normal lives.

References

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