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## INFLAMMATORY BOWEL DISEASE

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Inflammatory bowel disease is well recognized as one of the most common causes of chronic vomiting, weight loss and less frequently diarrhea in cats. The term describes a group of chronic infiltrative intestinal diseases affecting the lamina propria. All parts of the GI tract can be affected but the small intestine; especially the proximal small intestine is affected most commonly. The spectrum of clinical signs is dependent on which parts of the GI tract are affected as well as the severity and type of inflammation. The principle inflammatory cell type is generally used to describe the disease. Lymphocytes and plasma cells are the most common infiltrate (lymphocytic-plasmacytic enteritis or enterocolitis). Eosinophils (eosinophilic enteritis or enterocolitis), neutrophils, or macrophages (granulomatous enteritis or enterocolitis) are less commonly seen. The etiology of inflammatory bowel disease is unknown but genetics, the environment, and the immune systems response to chronic stimulation from various antigens presented to the intestinal mucosa likely play a role.

### SIGNALMENT

Inflammatory bowel disease is most common in middle age to older cats but any age cat can be affected. Even cats as young as 4 months of age can be affected. No breed or sex predisposition has been documented. A few studies have noted a higher incidence in purebred cats but these observations have not been consistent.

### CLINICAL SIGNS

Chronic intermittent vomiting with or without weight loss and diarrhea are the most common clinical signs. Vomiting is seen in almost 80% of cases and weight loss is apparent in approximately 65%. Most cats vomit intermittently with less than 20% vomiting more than once a day. Frequent vomiting of hair balls may be a sign of inflammatory bowel disease. Proximal small intestinal inflammation probably decreases normal gastric and intestinal motility which impedes the normal movement of hair through the GI tract. Anorexia is seen in only about 40% of cats with IBD but it is the only clinical sign in some cats. An increased appetite may be noted in approximately 20% of affected cats. Diarrhea is only seen in about 40% of affected cats and tends to become more prominent as the disease severity worsens. It is important to remember this fact because many veterinarians do not think about IBD as a possible differential diagnosis if the owners do not report diarrhea as part of the clinical history. Small bowel diarrhea is generally the predominant clinical sign in young cats with IBD. If the small intestine is predominantly affected the diarrhea is typically characterized by large volumes of soft formed or bulky stool. Occasionally the diarrhea will be watery. Weight loss may be the only sign in some cats with small intestinal disease. If the large intestine is predominantly affected the stool may be normal with strings of mucus or blood at the very end or it may be loose and stringy from large quantities of mucus. Cats with large intestinal involvement generally defecate more frequently and may vocalize during defecation. Hematemesis and/or hematochezia are seen occasionally,

especially in cats with eosinophilic enteritis or enterocolitis. Cats with severe small intestinal disease may present systemically ill but only about 20% of cats with IBD will be depressed and lethargic. Lethargy is most common on the days that the affected cats are showing other clinical signs such as vomiting.

### DIAGNOSIS

Inflammatory bowel disease can mimic many other diseases, especially liver disease, so a thorough evaluation is important. Common differentials include hyperthyroidism, liver disease, intestinal lymphosarcoma, giardiasis, cryptosporidiosis, feline heartworm disease, food intolerance, and food allergies. Other differentials include other intestinal or gastric parasites, histoplasmosis, intestinal adenocarcinoma, exocrine pancreatic insufficiency, FIP, FIV, campylobacteriosis, salmonellosis, and functional bowel disorders. The diagnostic workup of a cat with signs suggestive of IBD usually involves a CBC, chemistry panel, urinalysis, T4, and/or radiographs. Many of these tests are done to rule out other causes of the observed signs. The CBC is usually normal. Non-specific findings such as mild anemia and stress leukogram may be seen. On the chemistry panel it is common for liver enzyme activities to be mildly to moderately increased [approximately 30% of cases]. The recognized association between IBD, inflammatory liver disease, and pancreatitis may be responsible for these increases in some cats but liver enzyme increases without concurrent hepatocellular inflammation is common. Hypoproteinemia is unusual in cats with IBD but may be seen in severely affected animals. When seen, liver disease resulting in decreased albumin production, intestinal lymphosarcoma causing protein malabsorption, or chronic blood loss should be suspected. Hypocholesterolemia was noted to be the most common biochemical abnormality in one study. Serum cobalamin (vitamin B12) should be evaluated as cobalamin malabsorption may be common in severe cases of IBD. The clinical signs of cobalamin deficiency can very closely mimic the signs of IBD. Serum T4 should be run in all cats greater than 5 years of age that show chronic GI signs. Abdominal radiographs should be used to rule out obstructive intestinal disease and thoracic radiographs may be helpful in ruling out heartworm disease. Intestinal biopsy is the most important diagnostic test to rule in IBD and to characterize the subset of disease. Endoscopy is useful for biopsy in most cases. Lymphocytic/plasmacytic enteritis or enterocolitis is the most common form of IBD in cats. It is generally moderately responsive to treatment. Eosinophilic enteritis is less common and while very responsive to therapy in the dog, requires more aggressive therapy in the cat. Eosinophilic infiltrates can be seen along with lymphocytes and plasma cells and this generally does not indicate a worse prognosis. Granulomatous enteritis is uncommon and is generally poorly responsive to treatment.

### TREATMENT

Elimination diets should be attempted initially to rule out a dietary component to the disease. This is often performed empirically prior to biopsy. Some cats will respond favorably to hypoallergenic diets such as Hill's™ d/d or z/d; Iams Response™ LB/Feline Canned Formula; IVD™ Limited Ingredient Diets, or Royal Canin Hypoallergenic DR 25 or Sensitivity Control SC 31. Others will respond more favorably to diets containing large amounts of fiber. I have had success using semi-moist diets even when hypoallergenic or

fiber containing diets have failed. Gastrointestinal (easily digestible) diets such as Hill's™ i/d, Iams Low-Residue™ Adult/Feline Dry Formula, Purina EN GastroENteric® Feline Formula, or Royal Canin Intestinal GI 32 may also play a role in some cats. A trial an error approach to dietary management is sometimes necessary as some cats will respond well to one type of diet while other will respond better to another. Cats with both GI signs and pruritis are more likely to respond to dietary manipulation than cats with GI signs alone.

Unfortunately, most cats will not respond to dietary manipulation alone and corticosteroids become the cornerstone of therapy. Prednisone (2 mg/kg/day for 2 to 4 weeks then taper in cats with mild disease and 4-6 mg/kg/day in cats with severe disease or eosinophilic enteritis) is the most commonly used therapy when dietary therapy has failed to control clinical signs. Some cats will respond better to dexamethasone. Methylprednisolone acetate (Depo-Medrol) may be often used in cats that will not tolerate or allow chronic oral therapy. It can be used at a dose scheme of 20 mg sub Q 2 weeks for 3 treatments then as needed to control signs. Approximately 85% of cats with IBD will respond favorable to steroids with almost 20% having complete resolution of signs. If steroids alone do not control signs then antibiotics such as metronidazole or azithromycin may be effective. The role of antibiotics in treating feline IBD is not well documented but some cats will be antibiotic responsive. The immune modulating properties of some of the antibiotics like metronidazole may explain the therapeutic success but the role of intestinal bacteria as an antigenic trigger must also be considered. Metronidazole (7 to 10 mg/kg PO bid-tid) is used to treat small intestinal bacterial overgrowth (a condition that is probably not common in the cat) and also has an immune system modulating effect. Toxicity is generally referable to the nervous system (tremors, ataxia, cerebellar signs) and tend to occur at doses more applicable to treatment of Giardia. Immunosuppressives other than glucocorticoids can be added to the treatment regime.

Other immunosuppressive agents that might be used include azathioprine 0.3 mg/kg PO q 2-3 days [cat] or chlorambucil (2-4 mg/M<sup>2</sup> PO q 2-7 days or 10 mg/M<sup>2</sup> PO q 14 days) which is a better alternative in the cat. Myelosuppression is the most common side effect of these alternative immunosuppressants so CBC and platelet count should be monitored. Steroid or other immunosuppressive therapy is usually required for a minimum of 3 to 4 months. If during the steroid taper signs recur, the dose of medications should be increased back to higher doses and the taper started over. Some animals require continuous therapy for life.

Recently, budesonide (1 mg/cat) has been used in lieu of prednisone or other glucocorticoids. Budesonide is a steroid that has a high first pass metabolism and thus reduces the systemic side effects. As cats are usually resistant to the systemic side effects of glucocorticoids, budesonide will likely have a limited role in the treatment of IBD in this species. Cyclosporine has been used in the treatment of humans and dogs with IBD. The potential role in cats has not been evaluated.

#### **SEQUELAE**

Inflammatory bowel disease may be preneoplastic and result in progression to lymphosarcoma. This is a well recognized complication of severe celiac disease in people but the evidence for this type of phenomenon occurring in cats is not substantive at this time. Fat malabsorption may cause vitamin K deficiency and a reduction in vitamin K dependent clotting factors (II, VII, IX, X). Bleeding is an uncommon problem but can be devastating when it occurs. Coagulation testing should be performed in suspect cases. PT, aPTT, and PIVKA will be prolonged. Cobalamin malabsorption may lead to tissue deficiency of cobalamin requiring supplementation. Injectable cobalamin can be administered 250 ug subcutaneously once a week for 6 weeks, then every 2 weeks for 6 doses, then monthly. Most generic cobalamin preparations contain 1 mg/ml (1000 ug/ml). Most multi-vitamin and B-complex injectable formulations contain significantly lower concentrations of cobalamin.