Dietary Management of Gastrointestinal Disease

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Abstract: Nutrition plays a key role in the management of gastrointestinal disease, and some patients may be managed by dietary therapy alone. Dietary ingredients can have a negative or positive effect on the bowel. Negative factors in a diet may include toxins, allergens, toxic dietary excesses, or nutritional deficiencies. Diet also has a direct effect on intestinal physiology, affecting motility, cell renewal rate, intestinal microbiome, enzyme production, ammonia production, and volatile fatty acid content. This article discusses dietary therapy of acute gastroenteritis, chronic gastroenteropathies, and feline constipation.

Nutrition plays a key role in the management of gastrointestinal (GI) disease, and some patients may be managed by dietary therapy alone. Dietary ingredients can have a negative or positive effect on the bowel. Negative factors in a diet may include toxins, allergens, toxic dietary excesses, or nutritional deficiencies. Diet also has a direct effect on intestinal physiology, affecting motility, cell renewal rate, intestinal microbiome, enzyme production, ammonia production, and volatile fatty acid content. Recent research in diet and GI disease has resulted in rethinking some traditional approaches to treatment. This article addresses the management of several (but far from all) GI diseases and conditions.

Treatment of Acute Vomiting and Diarrhea of Small Intestinal Origin: To Feed or Not To Feed?

Traditionally, dogs and cats with acute vomiting and diarrhea due to dietary indiscretion have been managed by withholding food for 24 to 48 hours for “bowel rest.” Fasting, even for this period of time, decreases the length of the intestinal villi, increases the risk of bacterial translocation, and reduces activity of intestinal disaccharide enzymes. In addition, the bowel does not necessarily “rest” when empty: during fasting, dogs experience migrating motility complexes or “housekeeping waves”; cats experience a similar motility pattern. During inflammation, normal motility is likely decreased and ileus and delayed gastric emptying are present.

“Feeding through diarrhea” (i.e., feeding while a patient still shows clinical signs) may help maintain the activity of small intestinal digestive enzymes and help preserve normal villi morphology. The presence of food in the intestine also decreases the risk of bacterial translocation. Further, feeding small amounts may improve intestinal motility and gastric emptying. In some cases of osmotic diarrhea, feeding worsens clinical signs; therefore, patients should be treated individually and feeding stopped if diarrhea appears to worsen.

When intractable vomiting is present, oral intake of food should generally be avoided, but for as short a time as possible. In dogs infected with parvovirus, early enteral feeding results in faster resolution of vomiting and diarrhea than does withholding food. Similar to feeding during diarrhea, feeding small amounts may improve gastric emptying and a return to normal motility. Highly digestible foods with a low to moderate fat content should be considered because high-fat diets may slow gastric emptying and promote vomiting in some patients. Parenteral fluids and electrolytes should be provided as needed, and antiemetics should be used if the presence of a GI foreign body has been ruled out.

Chronic Enteropathies and Inflammatory Bowel Disease

The term inflammatory bowel disease (IBD) includes a group of chronic enteropathies characterized by chronic or recurrent vomiting and/or small intestinal diarrhea with histopathologic evidence of inflammatory cells in the GI tract. The underlying cause of IBD is not fully understood; it is likely due to complex interactions among genetics, diet, and the intestinal microbiome (microflora). In humans, IBD is thought to be due to dysregulation of the mucosal immune response to the intestinal microbiota or to food antigens. Dysbiosis of the microbiome has also been implicated as a cause of IBD in dogs, and intestinal inflammation is associated with a shift in the microbiome population from members of the gram-positive Firmicutes (e.g., Clostridiales) to gram-negative bacteria such as Proteobacteria (e.g., Enterobacteriaceae).

While the use of immunosuppressive doses of corticosteroids has been a common therapy for IBD, many clinicians are now recommending the performance of a diet trial before the use of corticosteroids or other immunosuppressive medications. Some clinicians think that dogs and cats with food-responsive disease are in a different category than animals with IBD that is not responsive...
to diet change alone; however, dietary antigens are likely to play a role in IBD, and many affected animals have intestinal inflammation, so the differentiation may not be needed.

Dietary proteins are the major source of food antigens. The inflammation in IBD likely increases intestinal permeability and contributes to antigenic exposure. This may result in a pet developing sensitivity to its diet or treats. To make appropriate dietary recommendations, a full dietary history should be obtained, including treats, chews, and foods used for medication. The diet should be changed (usually over several days) to a highly digestible diet that does not contain a previously fed protein source. All potential sources of dietary antigens (e.g., treats, some chewable medications) should be avoided. This can be done by feeding a novel protein diet or a hydrolyzed protein diet.

**Novel Protein Diets**

In a study of cats with chronic idiopathic GI signs, clinical signs improved in 50% of cats, usually within 4 days after a highly digestible novel protein diet was fed. In 20% of these cats, clinical signs did not recur after challenge with their previous diet. These cats did not have a persistent adverse reaction to food, as they did not respond to challenge. It is possible that the novel diet allowed repair of the intestines or affected the GI microbiome positively. In a study of 65 dogs with chronic GI signs, 39 (60%) responded to a novel protein, salmon, and rice diet fed for 10 days. It appears that many dogs and cats with chronic GI signs are responsive to dietary therapy with a highly digestible novel protein diet. Some of these patients may also be able to return to a previous diet, perhaps due to restoration of normal mucosal immunity or other beneficial changes in the intestinal environment. It is also possible that factors other than a novel protein source may improve clinical signs.

Some over-the-counter novel protein diets have been contaminated with protein sources not listed in the ingredients, which may result in a lack of resolution of signs.

**Hydrolyzed Protein Diets**

The protein in hydrolyzed protein diets has been broken down by enzymes into small peptides that are less allergenic than entire proteins. Available diets include hydrolyzed chicken, soy protein, or feathers or a combination of these. No studies have compared the effectiveness of these diets for managing diarrhea. Some of these diets are made with very small peptides and/or amino acids to minimize the possibility of an animal developing an antigenic response.

Hydrolyzed diets have very good digestibility. In dogs and cats with severe intestinal disease, the use of hydrolyzed diets may improve nutrient absorption and decrease antigenic exposure. In a 2010 study, 26 dogs with chronic GI signs were fed either a hydrolyzed diet or a highly digestible “intestinal” diet containing proteins from various sources; the latter served as the control. The initial response to both diets was good, with improvement in clinical signs in about 88% of dogs for both diets. Of the dogs that responded but were later challenged with their original diet, about two-thirds of the dogs on either diet relapsed. While the diets showed similar initial response, at a long-term follow-up (median: about 3.5 years), the dogs on the hydrolyzed diet (13 of 14 dogs) were more likely to still be in remission compared with those on the intestinal diet (one of six dogs; three dogs were lost to follow-up). The dogs on the intestinal diet may have become sensitized to ingredients in the diet, as four of the dogs improved when put on the hydrolyzed diet.

In a study of eight cats with IBD, feeding a hydrolyzed protein diet resulted in resolution of clinical signs within 4 to 8 days in all 8 cats, similar to the study using a novel protein diet; however, in these cats, a challenge with a previous diet resulted in recurrence of the clinical signs.

**Which Diet Should Be Fed: Novel Protein or Hydrolyzed Protein?**

The primary role of hydrolyzed protein diets is similar to that of novel protein diets—to diagnose or treat/manage food-sensitive gastroenteropathies. Many dogs and cats have been exposed to a variety of dietary proteins, but the use of hydrolyzed diets usually overcomes the challenge of finding a protein source that a pet has not previously eaten. Although uncommon, it is possible for a patient to react adversely if it is sensitive to the protein source in the hydrolyzed diet. In one study, three of 14 soy-sensitive dogs fed a hydrolyzed soy diet showed a dermatologic reaction. In some cases, using a diet with a very small particle size or avoiding the previous dietary protein may be necessary. Some patients have failed an elimination diet trial using a novel intact protein diet but then responded to a hydrolyzed protein diet.

While the needs of each pet and owner should be considered, it may be reasonable to use hydrolyzed diets as a diagnostic tool to determine whether there is a dietary component to GI disease. As these diets are expensive, an owner may not wish to continue feeding them long term.

While no studies have provided good evidence-based data on when a diet may be changed, one recommendation is to feed a diet that has resulted in clinical improvement for 6 months to 1 year and then add a single protein source as a trial. If a protein a patient tolerates is found, choosing a commercial diet based on this protein may be beneficial.

**Constipated Cats**

Constipation—infrequent or absent defecation associated with fecal retention in the colon and rectum—is a relatively common problem...
clinical problem in cats. It may lead to obstipation, which is intractable constipation in which defecation becomes impossible without medical intervention. The potential etiologies of constipation include diet, lack of exercise, mechanical obstruction, neurologic disease, dehydration, administration of drugs, and some endocrinopathies. Medical treatment includes addressing the underlying cause, if possible; correcting fluid and electrolyte disorders; and removing feces by using laxatives, enemas, prokinetics, and surgery, if necessary. 

Dietary recommendations have included feeding highly digestible diets to decrease the amount of feces and increasing dietary fiber to improve colonic motility. If a cat develops megacolon with little to no motility, surgical subcolectomy and provision of a highly digestible, low-residue diet may be indicated.

For cats with constipation but not megacolon, the use of added dietary fiber may be indicated. Fiber is plant material resistant to digestion by the small intestine. A wide variety of dietary fibers exist, including cellulose, hemicellulose, pectins, gums, and lignins. Fibers are divided into soluble and insoluble types. Generally, soluble fibers attract water, form gels, delay gastric emptying, and are highly fermentable in the colon. Insoluble fibers may hasten gastric emptying, are not gel forming, are less fermentable in the colon, and provide bulk within the colon. Many fiber sources have properties of both classifications. The “crude fiber” reported on pet food labels is mostly insoluble and does not include the amount of soluble, more fermentable fiber sources.

Recommendations for diets for cats with constipation have included the use of fibers with low solubility to provide fecal bulk and improve colonic motility by distending the colon. Insoluble fibers can decrease moisture in stool, and many cats with constipation already have a distended colon with dry feces, which would make the use of insoluble fiber less appropriate in these cats. Fermentable fiber increases the amount of short-chain fatty acids in the stool; this is thought to positively affect colon motility. However, too much fiber fermentation can lead to diarrhea.

Psyllium—a soluble fiber with low fermentability—produces a mucilaginous gel when combined with water. It also provides stool bulking. In people with constipation, the addition of psyllium increases stool frequency and improves stool consistency. A commercial psyllium-enriched dry diet has been studied in an uncontrolled trial in cats with constipation. Clinical improvement and improved stool quality were seen in more than 80% of the cats within a week of starting the diet. In many of the cats, doses of lactulose and cisapride could be decreased. The long-term use of this diet and its potential for decreasing the risk of megacolon have not yet been studied.

Conclusion

The GI tract is the organ most directly affected by nutrition, and new studies are continually improving the diagnosis and dietary therapy of GI disease.

References

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