Gastrointestinal Disorders

PROTEIN-LOSING ENTEROPATHY IN DOGS

Protein-losing enteropathy (PLE) is a syndrome characterized by excessive loss of plasma proteins, particularly albumin, into the gastrointestinal (GI) tract. Most often, protein loss reflects conditions in the small intestine that interfere with digestion and/or absorption of nutrients, such as increased mucosal permeability, lymphatic obstruction or rupture, and mucosal ulceration or erosion.

In adult dogs, the major diseases associated with PLE include primary GI disorders, such as intestinal lymphangiectasia, severe chronic enteropathy and intestinal lymphoma, although any GI disease can lead to intestinal protein loss if it is severe enough.

Dogs with PLE typically have a severe negative protein and energy balance that makes nutritional support essential. Diet modification is one component of an aggressive, multimodal approach to the therapeutic management of dogs with protein-losing enteropathy.

Key Messages

- Dietary fat should be restricted (< 4 g/100 kcal metabolizable energy [ME]) for dogs with PLE, regardless of the underlying cause.
- Many fats in dog foods consist of long-chain triglycerides (LCTs), which are packaged into chylomicrons inside enterocytes and then transported via the lymphatic system to the thoracic duct where they enter the general circulation.
- LCT absorption increases lymph flow and protein content, which can contribute to lymphatic congestion, mucosal damage and protein loss, and worsen clinical signs.
- Limiting dietary fat intake decreases lymph flow, reduces lymphatic vessel distention, and minimizes protein losses.
- Dogs with PLE can be cachectic. Since low-fat diets are lower in calories, dogs experiencing severe weight loss may benefit from a diet containing C8 and C10 medium-chain fatty acids (MCFAs) as an alternative energy source.
- Medium-chain triglycerides (MCTs) can replace some, but not all, long-chain triglycerides in the diet. Linoleic acid, alpha-linolenic acid, eicosapentaenoic acid (EPA), and docosahexaenoic acid (DHA) are all long-chain fatty acids that are considered essential for dogs.

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Key Messages (continued)

- MCTs are quickly and easily digested in the small intestinal lumen without stimulating cholecystokinin secretion or relying on pancreatic lipase and bile acids for absorption.5,8
- Most of the MCFAs are absorbed rapidly and transported via the portal vein directly to the liver.6,8 A small amount of MCFAs can be incorporated into chylomicrons and transported via the lymphatic system, but this is dramatically less than with LCTs.9
- When lymphangiectasia (which is covered in more detail separately) is the underlying cause of protein-losing enteropathy, a highly digestible, low- or very-low-fat diet (< 4 g/100 kcal ME and < 2 g/100 kcal ME, respectively) that provides enough protein and calories is usually recommended to prevent further lacteal dilation and rupture and to remove a source of intestinal inflammation (i.e., lymph leakage).
- When PLE is associated with chronic enteropathy (which is also covered in more detail separately), a highly digestible hydrolyzed or novel protein diet that also is low in fat and highly palatable should be considered to reduce diet-related inflammation, support protein synthesis in the liver, and replace lost tissue proteins.1
- In severe or nonresponsive cases, an amino acid-based, or elemental, diet can provide readily available amino acids and small peptides for protein synthesis.1
- Low serum cobalamin (vitamin B12) concentrations can occur in concurrent PLE-chronic enteropathy cases, negatively affecting metabolism and delaying healing of intestinal inflammation.4 Parenteral cobalamin supplementation may be necessary.
- Supplementation with fat-soluble vitamins (i.e., A, D, E, and K) may be needed due to chronically impaired fat absorption or when dietary fat content is low.
- Dogs with PLE initially should be fed small meals 3 to 4 times per day to increase food intake and improve nutrient absorption.
- In severe cases, partial or total parenteral nutrition may be needed to facilitate recovery.

References