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.[1] 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.[2]

In adult dogs, the major diseases associated with PLE include primary GI disorders, such as intestinal lymphangiectasia, severe chronic enteropathy and intestinal lymphoma,[1,3] although any GI disease can lead to intestinal protein loss if it is severe enough.[3,4]

Dogs with PLE typically have a severe negative protein and energy balance that makes nutritional support essential.[1] 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.
  - Most 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.[6]
  - LCT absorption increases lymph flow and protein content,[7] which can contribute to lymphatic congestion, mucosal damage and protein loss, and worsen clinical signs.[8]
  - Limiting dietary fat intake decreases lymph flow, reduces lymphatic vessel distention, and minimizes protein losses.[8]
- Dogs with PLE can be cachectic.[8] 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.[5,8]
  - 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.

DID YOU KNOW?

Protein-losing enteropathy in dogs is associated with lymphangiectasia in about 50% of cases and with lymphoplasmacytic enteritis, the most common form of inflammatory chronic enteropathy, in about 66%.[5]

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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.[9] 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.

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