Gastroenterology

PANCREATIC RESPONSE TO DIETARY FAT

Background

Acute pancreatitis in dogs is often associated with high morbidity and mortality rates. Traditional treatment has included withholding food followed by feeding a low-fat diet. Experimental studies in dogs have indicated that provision of enteral nutrition early in the course of the disease improves survival and decreases complication rates. However, the ideal diet has never been determined.

Serum canine trypsin-like immunoreactivity (cTLI) concentration is a specific marker of exocrine pancreatic function that is the most sensitive and specific test for the diagnosis of exocrine pancreatic insufficiency in dogs. However, it has relatively low sensitivity for detection of pancreatitis.

Compared with total serum lipase activity, assessment of serum canine pancreatic lipase immunoreactivity (cPLI) concentration appears to have improved sensitivity and specificity as a commercially available laboratory test for diagnosis of pancreatitis in dogs. Prednisolone administration or concurrent renal failure which affect serum lipase concentrations does not affect serum cPLI concentrations. Exocrine pancreatic insufficiency does decrease serum cPLI concentration. Therefore, it also may be a useful marker for indirect determination of the degree of pancreatic adaptation or the response within an individual dog.

The determination of serum gastrin concentration may serve as the indirect measure of one aspect of pancreatic stimulation. G-type cells in the gastric antrum secrete gastrin in response to gastric distension and ingestion of protein. The main forms of gastrin secreted in dogs are gastrin 34, 17, and 14. Their circulating half-time is short (3 to 9 minutes). The presence of gastrin stimulates pancreatic acinar cells to release lysosomes and zymogens in response to food. This response occurs both neurologically through anticipation and hormonally by the smell of food and the presence of food in the stomach and small intestine.

Objectives

To assess the pancreatic response in healthy dogs fed diets of different fat compositions with or without supplemental pancreatic enzymes and medium-chain triglycerides (MCTs).

Procedure

Ten clinically healthy adult dogs were fed 4 diets once in random order at 1-week intervals. Diets A and B contained 16% and 5% crude fat, respectively. Diet C was composed of diet A with pancreatic enzymes, and diet D was composed of diet B with pancreatic enzymes and MCTs. Serum cTLI and cPLI concentrations were measured before and at 1 to 2 and 6 hours after feeding. Serum gastrin concentration was measured before feeding and 5 to 10 minutes and 1 to 2 hours after feeding.

Results

Serum cTLI, cPLI, or gastrin concentrations did not differ among the different diets fed, among the dogs, nor over time. When multiple comparisons were analyzed, diet D caused the least amount of measurable pancreatic response, although this difference was not significant.

Author Conclusion

Results did not indicate a significant effect of dietary fat content or addition of supplemental MCT oil or pancreatic enzymes in diets on serum cTLI, cPLI, or gastrin concentrations in healthy dogs.

Inclusions

Four figures, 14 reference.

Editor Annotation

This study indirectly assessed the pancreatic response in 10 healthy dogs that were fed 4 different diets by measuring serum cTLI, cPLI, and gastrin levels. Four diets were fed in random order at weekly intervals. Diet A was PurinaONE; diet B was Royal Canin digestive low fat diet; diet C was composed of diet A with supplemental pancreatic enzymes; and diet D was composed of diet B, pancreatic enzymes, and MCT oil.

Results indicated that fat content of diets, or the addition of MCT oil, or the addition of pancreatic enzymes to diets of healthy dogs did not have any significant effect on serum cTLI, cPLI, or gastrin concentration. Further studies are required to adequately challenge the conventional practice of feeding low fat diets to all dogs with pancreatitis rather than feeding such diets only to those with fasting hyperlipidemia. (MM)

James FE, Mansfield CS, Steiner JM, et al. Pancreatic response in healthy dogs fed diets of various fat compositions. Am J Vet Res 2009;70:614-618.