

Pancreatitis and Canine Kidney Disease



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Pancreatitis occurs all too frequently during the progressive course of kidney failure in dogs. It is a painful condition and always needs a short or longer-term diet adaptation while the inflammation eases. In more severe cases it requires medications including pain killers, anti-inflammatories, intravenous fluids, and/or specific antibiotics.

What Is The Pancreas?

The pancreas is a small but vital gland on the right-hand side of the abdomen close to the liver and kidney. It sits behind the small intestine and is adjacent to the stomach. While its role in the canine body is sometimes simply described as assisting digestion, it does so much more than that.

Pancreatic juices are secreted into the intestine in response to a dog eating food. These enzymes assist in digesting proteins, carbohydrates, and predominantly fats. The pancreas also contains beta-cells that form the Islets of Langerhans, and this produces insulin. Insulin is released in response to rising blood glucose from eating food. Insulin deals with blood sugar by moving it into body cells to reduce excessively high levels. In this way, insulin lowers blood glucose concentration. Of course, during daily life and particularly during exercise the opposite occurs where blood glucose can fall to dangerously low levels. The pancreas then releases a hormone called glucagon to increase blood glucose back into circulating blood.

What Happens when the Pancreas is Damaged?

The essential health maintaining roles of the pancreas are adversely affected by different conditions. Congenital defects, trauma, obesity, and other conditions can interfere with the production and release of adequate amounts of insulin and glucagon. In such circumstances, a dog becomes diabetic where insufficient insulin

is produced to control rising blood glucose. Left untreated, this major health condition can lead to poor blood circulation, blindness, severe fatigue and confusion, seizures, coma, and ultimately death.

A disorder known as exocrine pancreatic insufficiency (EPI) occurs rarely in dogs causing a deficiency in pancreatic enzymes. This adversely affects digestion and undermines the dog's ability to digest food effectively. EPI is more common in certain breeds and even more specifically in German Shepherds.

Canine pancreatic carcinoma occurs infrequently but is a very serious condition when it does. Depending on the type of cancer different areas of the pancreas are affected. Pancreatic adenocarcinoma is glandular and extremely invasive. Insulinoma is a tumour that produces insulin, glucagonomas secrete glucagon, and gastrinomas produce excessive amounts of gastrin hormone.

Inflammation of the pancreas is usually referred to as pancreatitis. The inflammation results from the inappropriate, early activation of an enzyme within the pancreas, which causes the gland to digest itself. This is quite common in dogs generally but much more so for those suffering from kidney disease and kidney insufficiency. Many dogs also have a genetic predisposition to the condition and 90% of cases are said to be idiopathic (cause undetermined). Pancreatitis can be acute or chronic and ordinarily occurs when a dog's diet is too rich in fat. It is painful, causes vomiting, depression and inappetence ... and, in severe cases, it can be fatal.

Why do Dogs with Kidney Disease Commonly get Pancreatitis?

Some generally healthy dogs and certain breeds of dogs are prone to pancreatitis and others are not. Miniature schnauzers, miniature poodles, and cocker spaniels are more inclined to it. In addition, it tends to occur more in middle-aged to older dogs, overweight dogs, and females. Kidney disease makes it far more likely to arise and is, therefore, something that owners need to be aware of and look out for.

Diet has an important influence on the condition. Dogs with kidney disease are usually advised to eat a special renal diet that is lower in protein, sodium and phosphorous. Manufacturers of these products increase the fat content of ingredients to offset the loss of protein. This helps maintain energy, prevent weight loss, and provides nutritional value. Unfortunately, it can also inflame the pancreas.

Other influences associated with poor renal health, viral and bacterial infections, and some medications, are also known to trigger pancreatitis.

The associated health conditions common to kidney disease and involved in exacerbating pancreatic inflammation include hypothyroidism (and other endocrine diseases), and low daily urine output. The latter is known as Oliguria and is defined as urine output ranging from less than 0.27 ml/kg/hr to less than 1 to 2 ml/kg/hr. Medications such as antihypertensives (blood pressure treatments), thiazide diuretics (a drug used to increase urine output), certain corticosteroids, some antibiotics, and calcium and potassium supplements are all associated with the inflammation.

Diagnosing Pancreatitis – Physical Symptoms

Some of the symptoms of pancreatitis overlap with very similar symptoms of canine kidney disease while others are quite different. It is therefore often difficult to know for certain when a flare-up is starting. Typical symptoms include nausea, vomiting, fever or low body temperature, lethargy, abdominal pain, diarrhoea, and decreased appetite. One of the tell-tale physical indications is a dog that goes into a 'praying' position consistently (rear up in the air and front paws and head close to the floor). Hunching of the back is also very typical.

When these symptoms are observed owners are advised to seek veterinary assistance as soon as possible. Mild cases are sometimes easily treated, but severe bouts are far more difficult to resolve and can lead quickly to life-threatening extremes if left without immediate intervention.

Diagnosing Pancreatitis – Blood Testing

If pancreatitis is suspected, a vet will ordinarily perform a blood check to see if serum lipase and/or serum amylase are abnormally high. While these abnormal levels raise the suspicion of a flare-up, the definitive blood test needed will be a SNAP cPL or Spec cPL (canine pancreas-specific lipase). Studies in 2014 show that SNAP cPL and Spec cPL results may provide a "false positive" diagnosis of pancreatitis in up to 40% of dogs presenting with acute abdominal disease. Accuracy of the SNAP cPL and Spec cPL for a clinical diagnosis of pancreatitis was found to be 66% and 75%, respectively (PMID: 24739030).

Further developments of the SNAP cPL test in the intervening period have improved its accuracy. Approximately 85% of dogs with pancreatitis will show high values of cPLI (Canine Pancreatic Lipase Immunoreactivity). If the cPLI is high there is a 96% certainty that the patient has pancreatitis and not another disease that causes similar signs. The cPLI is currently considered the best blood test available for diagnosing pancreatitis in dogs. Moreover, the results show how severe the inflammation is and a vet can then decide the best method of managing or treating it.

What Diet Changes are Needed?

Withholding food and water for 24 hours will allow the pancreas to rest, but this may not be an option if the dog is already poor at eating and/or drinking and is losing weight.

A reduced (low) fat diet is the key to controlling an acute onset of pancreatitis. Over several days this can ease the inflammation and return things to a more normal condition. However, chronic pancreatitis is more difficult to control and even more so for dogs with kidney disease. These dogs often suffer from nausea, vomiting, and inappetence, and therefore quickly become undernourished. Weight loss is a problem owners frequently have to contend with. A weekly weight record is always a good idea to help assess a kidney dog's stability, decline or improvement.

Commercial renal dog food products generally have reduced protein. The manufacturers offset this loss of an important nutritional element by increasing the

fat content. And the fat content increases the likelihood of pancreatitis. This type of specialist food, therefore, helps the kidney disease but aggravates the inflammation of the gland. It is a Catch-22 situation that owners find themselves in, but see 'Finding the Right Balance' below.

Those that are home cooking for their dogs can reduce the fat content by choosing low-fat lean meats and poultry, increase carbohydrates such as sticky white rice, couscous or barley, and thereby provide an adequate kidney-friendly calorific meal until the pancreatitis is back under control. Those using a commercial product may need the assistance of veterinary advice, a nutritionist, and other medicinal forms of treatment if the inflammation fails to be quickly resolved.

Finding the Right Diet

The nutritional goals are to create a low fat, moderate to low protein, phosphorus-restricted diet, enriched with mixed fermentable fibre, antioxidants, and omega-3 fatty acids. Not easy to say the least.

Two recipes were developed by Fernandez-Prado et al (NCBI article PMC5452219) which seem to satisfy these goals and were successful for the case study they developed them for. The first was a turkey and white rice-based recipe with additional vegetables like cabbage, kale and broccoli. The second recipe contained canned tuna and salmon (in unsalted water), with rice, carrot, red capsicum and pumpkin. To each recipe, they added vitamins and supplements to ensure they were properly nutritionally balanced.

What Medications Might Be Needed?

While diet adaptations can remedy mild pancreatitis over a week or so, Intravenous fluid therapy is the first line of treatment for all cases of severe and debilitating inflammation. Pancreatitis can develop out of mild to severe dehydration. Vomiting and/or bouts of diarrhoea compound the problem. These quickly result in the fluid output being greater than input, and dehydration becomes the overriding health concern with inflammation of the pancreas secondary to it.

Painkillers are often needed to help make the dog feel more comfortable. Although commonly prescribed by vets, Tramadol should not be used for pets that are hypersensitive to opioids. It should be used with caution in patients with seizure disorders, liver or kidney disease. Tramadol is excreted at the rate of 30% by the kidneys, so when a dog has kidney insufficiency this pain killer can build up to toxic levels.

Galliprant is a different kind of pain killer that interferes with a specific prostaglandin receptor called the EP4 receptor. It is the receptor involved in generating pain and inflammation. By interfering with only the EP4 receptor, galliprant suppresses pain with no effect on the kidney, blood-clotting mechanisms, or GI tract. This is however a relatively new drug. Research and testing for as yet unknown interactions with other medications and body systems are ongoing.

Antiemetic medication may be needed to help control and prevent vomiting.

While there are numerous useful home remedies for diarrhoea (pumpkin, rice water, or unsweetened applesauce for example), there are times when medications are needed. This is often the case when pancreatitis has developed and the diarrhoea is constant.

Metronidazole (brand name Flagyl) is a useful and commonly prescribed treatment for gaining control of loose stools. Unfortunately, it is contraindicated for dogs with kidney disease, so while it may be safe in very low doses and given short-term only, caution is advised. One of the issues with metronidazole is its adverse effect on gut bacteria, resulting in an imbalanced gut microbiome. Due to this and other effects, the drug can make diarrhoea worse in some cases.

When diarrhoea is persistent in your pet, seek advice from your vet.

Fish oil may seem counterintuitive at first, because of its high-fat content, but it can help lower blood lipid levels. Studies suggest a high level of fish oil (about 1,000 mg. per 10 pounds of body weight for a dog with high lipid levels; about half that amount for dogs with normal levels) is helpful to dogs with acute pancreatitis. Look at blood test results for triglycerides and cholesterol levels to help assess the balance of lipids. When supplementing with fish oil, also supplement with 5 to 10 IU of vitamin E (American Kennel Club).

In Conclusion

Canine kidney disease is challenging to manage even without the multitude of additional disorders associated with it. But when pancreatitis presents itself, it is vital to treat it quickly and effectively. Dealing with it may involve a 'trade-off' for short-term kidney function deterioration and additional weight loss, but until more effective and less problematic treatments are available, that is unfortunately just the way things are for now. I hope this article provides you with some useful information and treatment suggestions to discuss with your vet and/or a veterinary nutritionist.

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