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Glomerulonephritis

Issue Description

Glomerulonephritis is a renal disease characterized by inflammation of the glomeruli, or small blood vessels in the kidneys.

Other Names

Glomerular Nephritis, GN

Causes

Glomerulonephritis occurs when large numbers of immune complexes – these are antigen-antibody complexes – circulating in the bloodstream become trapped in the glomeruli as they attempt to pass into the urine. Deposition of immune complexes triggers an inflammatory reaction that damages the glomeruli and results in proteinuria. The antigens bound to the antibodies in the immune complexes arise as a result of some chronic infectious, inflammatory or cancerous disease process. Several diseases have the potential to result in glomerulonephritis.

Some Causes Include:

- Viral infections
- Infectious hepatitis in dogs (canine adenovirus 1)
- Bacterial infections
- Lyme disease (borreliosis)
- Ehrlichiosis (an infectious disease transmitted by ticks)
- Rocky Mountain Spotted Fever (another disease transmitted by ticks)
- Brucellosis (an infectious disease)
- Dermatitis (infection of the skin)
- Gingivitis (infection of the gums)
- Endocarditis (infection of the heart valves)
- Prostatitis (infection of the prostate)
- Pyometra (infection of the uterus)
- Chronic fungal infections
- Heartworm disease
- Leishmaniasis (a protozoal infection rarely encountered in the United States and transmitted by sandflies)

Non-infectious inflammatory diseases that have been associated with glomerulonephritis include:

- Pancreatitis (inflammation of the pancreas)
- Immune-mediated polyarthritis (inflammation of the joints)
- Systemic lupus erythematosus (an autoimmune disorder)
- Neoplasia (cancer)
- Lymphosarcoma
- Mast cell tumor
- Other tumors

Despite the long list of infectious, inflammatory and neoplastic disease processes that can result in glomerulonephritis, in as many as 75 to 80 percent of dogs and cats with glomerulonephritis, the underlying cause cannot be identified and the disorder is referred to as "idiopathic."

Symptoms

The presenting complaint in dogs and cats with glomerulonephritis is variable and depends on the severity and duration of urine protein loss as well as the presence or absence of kidney failure and complications.

Clinical signs associated with mild to moderate proteinuria may be non-specific, such as weight loss and lethargy. With severe protein loss, fluid accumulation in the abdomen and in other areas of the body may occur, although this is uncommon. If the glomerular disease is extensive, kidney failure and resultant vomiting, inappetence increased drinking and urination, bad breath, and nausea may occur. Occasionally, signs associated with an underlying infectious, inflammatory, or cancerous disease may be the reason the owner seeks veterinary care.

Diagnosis

Persistent, severe elevations in protein in the urine with an otherwise normal urinalysis are the hallmark of glomerular disease.

Other laboratory tests such as a urine protein, creatinine ratio and blood work can be used to help confirm the diagnosis. The only way to definitively diagnosis glomerulonephritis is with a biopsy of the kidney.

Dogs with protein in their urine should be thoroughly evaluated for underlying infectious, inflammatory, or cancerous conditions. Testing may include blood tests for regional infectious diseases, urinalysis, x-rays of the chest, abdominal x-rays or ultrasound.

Treatment

- The most important treatment for glomerulonephritis is the identification and treatment of any underlying disease. The dog or cat should be subsequently evaluated for resolving protein in the urine.
- It is believed that uncontrolled proteinuria leads to progressive kidney damage. Angiotensin-converting enzyme inhibitors (ACEI) are a type of medication often used to help reduce protein levels in the urine. If high blood pressure is present, additional medications may be needed to help lower it.
- Low doses of aspirin are often given to prevent blood clots and further glomerular damage.
- Immunosuppressive medications such as prednisone may be used in some cases.
- Dietary protein restriction may be useful in the management of glomerulonephritis.

Potential Complications

- Increased blood pressure with resultant retinal detachment or hemorrhage may occur. Acute blindness due to retinal detachment may be the first complaint of dogs with glomerulonephritis.
- Increased coagulability of the blood with resultant blood clots are another complication associated with glomerulonephritis. The lungs are the most common location for a blood clot to lodge, and may result in severe respiratory illness that is difficult to treat.

Prognosis

The prognosis for dogs and cats with immune complex glomerulonephritis is fair to guarded unless the causative underlying disease can be identified and eliminated. A reduction in proteinuria with no increase in blood renal values indicates improvement or response to therapy.

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