

Pulmonary Hypertension (PHT)

Background

Elevated blood pressure within the lungs is called pulmonary hypertension (PHT). While any dog or cat can develop PHT, small breed dogs are most at risk. There are several etiologies that can result in PHT. These include primary lung disease (bronchitis, collapsing airway disease, veno-occlusive disease, etc.), pulmonary thromboembolism (blood clots within the lungs), neoplasia/cancer, heartworm disease, left-sided heart disease, chronic anemia, and idiopathic causes (no identifiable reason). Regardless of the cause, when the pressure becomes elevated, blood flow through the lungs and oxygenation are reduced causing clinical signs of coughing, exercise intolerance, cyanosis (blue tongue and mucous membranes), labored breathing, and syncope/collapse. Pulmonary hypertension can also cause right-sided congestive heart failure (build-up of fluid within the spaces surrounding the heart and lungs, and/or within the abdomen). Because the clinical signs and physical exam findings are nearly identical to left-sided congestive heart failure (fluid within the lungs), an echocardiogram and chest radiographs are required to ascertain a definitive diagnosis.

The diagnostic work-up for PHT often includes an echocardiogram, chest x-rays, coagulation testing, and blood work including a heartworm test. Specific diagnostics tests are chosen based on the history and breed as not all of these tests are necessary in every patient. In some cases, more advanced diagnostic tests (computed tomography, bronchoscopy, lung washes/culture, fluoroscopy) are recommended to identify a cause for PHT. Unfortunately, these diagnostics require heavy sedation and/or general anesthesia, which carry an increased risk in these patients.

Treatment

While the underlying cause of PHT is sometimes treatable (i.e. heartworm disease or bronchitis), in many cases a definitive cause is never found, and therapy is aimed at reducing the clinical signs of the disease. Treatment consists of sildenafil (Viagra) or tadalafil (Cialis) +/- pimobendan and L-arginine, which decrease the blood pressure within the lungs to improve blood flow. Other medications are often added to address the suspected underlying cause (i.e. bronchodilators, anti-inflammatory medications, antibiotics, blood thinners, etc.). Prostacyclin analogues and endothelin antagonists are widely used in human medicine but are cost prohibitive and understudied in veterinary medicine at this time.

Prognosis

The prognosis largely depends on the underlying cause, but sildenafil therapy has been shown to significantly improve survival and quality of life in several studies. In one study, patients that survived 1-day after hospitalization had a median survival time of approximately 5 months. Another study found that for patients who survived 1 week following hospital discharge, 75% were alive at 12 months. For some patients, PHT is a devastating disease that is rapidly progressive. Unfortunately, all patients with this condition remain at risk for sudden cardiac death.