



RESEARCH PROGRESS REPORT SUMMARY

Grant 02661: Investigation into Diet-Associated Dilated Cardiomyopathy in Dogs

Principal Investigator: Darcy Adin, DVM
Research Institution: University of Florida
Grant Amount: \$211,521
Start Date: 4/1/2019 **End Date:** 3/31/2021
Progress Report: End-Year 1
Report Due: 3/31/2020 **Report Received:** 3/13/2020

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Original Project Description:

Dilated cardiomyopathy (DCM) is a serious disease of the heart muscle whereby the heart becomes enlarged with weak contractions. DCM can result in abnormal heart rhythms, congestive heart failure or sudden death. In dogs, DCM most often occurs in large- and giant-breeds, such as Doberman Pinschers, Boxers, Irish Wolfhounds, and Great Danes; in these dogs, survival time after diagnosis is often only months, even with aggressive medical therapy. Recently, veterinary cardiologists have recognized DCM more frequently in all breeds of dogs including mixed breeds, and even those not usually associated with DCM. There is suspicion that the disease in some dogs is associated with boutique, exotic ingredient, or grain-free (BEG) diets. Some affected dogs on such diets have shown reversal or improvement of their disease after changing their diet, supporting a potential association between consumption of a BEG diet and development of DCM. A specific cause, however, has not been identified, despite extensive nutritional testing of the dog foods and the canine patients. Moreover, the extent of the problem is unknown because only dogs that are symptomatic for DCM have been reported. It is possible that more dogs may be affected but not yet showing signs of heart disease. To investigate the extent of diet-associated heart problems in dogs, this multi-institutional team of veterinary cardiologists and nutritionists will prospectively screen a large population of apparently healthy dogs for DCM and compare important cardiac disease measures, including ultrasound of the heart, blood biomarker and taurine concentrations, and the frequency of DCM in dogs eating BEG versus non-BEG diets.

Publications:

No publications have been prepared yet because case enrollment is not complete. We anticipate the generation of an initial publication for the cross-sectional analysis and then a subsequent publication



describing follow-up of cases with abnormalities. The abstract that has been accepted for poster presentation at the ACVIM Forum in June 2020 will be published in the Journal of Veterinary Internal Medicine in the fall of 2020 (see below).

Presentations:

An abstract has been accepted for poster presentation at the 2020 ACVIM Forum describing preliminary results of biomarker comparison between dogs eating different diet types.

Report to Grant Sponsor from Investigator:

The study titled “Investigation into Subclinical Diet-Associated Dilated Cardiomyopathy in Four Dog Breeds” is progressing on schedule. Enrollment for the first part of the study is at approximately 85%. We are aiming to finish enrollment by late spring/early summer, after which time we will concentrate on data collation and statistical analysis for the first part of the study. We are also following dogs enrolled at UF that have bloodwork or echocardiographic abnormalities for a year after a diet change is enacted, to determine if any of the abnormalities will improve with nutritional intervention. We do not know if any or all of these abnormalities in these dogs are related to food and so the role of follow-up is critical to this assessment. The number of dogs being followed at this time is approximately 25% of the total enrolled at UF.

ACVIM Abstract

The major findings of the AKC CHF funded study entitled “Predicting Disease Stage and Diuretic Responsiveness in Dogs with Acquired Heart Disease” have been published and showed that low blood chloride levels are associated with advanced, refractory congestive heart failure in dogs. The low chloride levels are most likely because of the diuretic medications used to treat heart failure although other causes are possible and were not investigated. We performed additional calculations on the data obtained from the 171 dogs that were enrolled in this study and found that adjusting (i.e. correcting) the blood chloride level by normalizing it for the blood sodium level provides information about the potential reasons that low chloride is present in these dogs with heart failure. Although the correction showed that the low chloride for most dogs was due to the diuretic medications, the adjustment in some dogs suggested that they may have overactivation of a specific hormone that retains water in heart failure. This was found moreso in dogs with refractory heart failure compared to dogs with controlled heart failure. We plan to investigate this in future studies by correlating this correction factor to levels of this hormone in the blood. This may lead to medications to specifically block this hormone and help treat dogs with advanced, refractory congestive heart failure.