Abstract: Ames MK, Atkins CE, Eriksson A, et al.:
Aldosterone breakthrough in dogs with naturally occurring myxomatous mitral valve disease.
Journal of Veterinary Cardiology (2017) **19**: 218-227

Introduction

Aldosterone breakthrough (ABT) is the condition in which angiotensin converting enzyme inhibitors (ACEIs) and/or angiotensin receptor blockers fail to effectively suppress the activity of the renin angiotensin aldosterone system. The objective of this study was to determine if ABT occurs in dogs with naturally occurring myxomatous mitral valve disease receiving an ACEI, using the urine aldosterone to creatinine ratio (UAldo:C) as a measure of renin angiotensin aldosterone system activation.

Animals, Materials and Methods

This study includes 39 dogs with myxomatous mitral valve disease. A UAldo:C cut-off definition (derived from a normal population of healthy, adult, and client-owned dogs) was used to determine the prevalence of ABT in this population. Spearman analysis and univariate logistic regression were used to evaluate the relationship between UAldo:C and ABT (yes/no) and eight variables (age, serum K^+ concentration, serum creatinine concentration, ACEI therapy duration and ACEI dosage, furosemide therapy duration and furosemide dosage, and urine sample storage time). Finally, the UAldo:C in dogs receiving spironolactone, as part congestive heart failure (CHF) therapy, was compared to dogs with CHF that were not receiving spironolactone.

Results

The prevalence of ABT was 32% in dogs with CHF and 30% in dogs without CHF. There was no relationship between either the UAldo:C or the likelihood of ABT and the eight variables. Therapy with spironolactone lead to a significant elevation of the UAldo:C.

Discussion

Using the UAldo:C and a relatively stringent definition of ABT, it appears that incomplete RAAS blockade is common in dogs with MMVD receiving an ACEI. The prevalence of ABT in this canine population mirrors that reported in humans. While the mechanism of ABT is likely multifactorial and still poorly understood, the proven existence of ABT in dogs offers the potential to improve the prognosis for MMVD with the addition of a mineralocorticoid receptor blocker to current therapeutic regimens.

Conclusions

Approximately 30% of dogs being treated for heart disease and CHF satisfied the definition of ABT. Identifying patient subpopulations experiencing ABT may help guide future study design and clinical decision-making.