PLASMA NT-proBNP CONCENTRATION IN RETIRED RACING GREYHOUNDS

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INTRODUCTION

Most sighthounds have cardiovascular idiosyncrasies that are often underrecognized. Studies of cardiovascular anatomy and physiology have shown that Greyhounds have a higher heart weight-to-body weight ratio than non-Greyhounds, as well as higher left ventricular free wall thickness; many Greyhounds have functional relative aortic stenosis murmurs with no detectable structural abnormalities. We recently reported that Greyhounds have significantly higher vertebral heart scores (VHS) than other dogs.

BACKGROUND

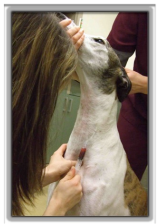
Natriuretic peptides of the B-type (BNP) are neuroendocrine peptides synthesized constitutively in atrial myocytes and released in response to volume or pressure overload. In humans, BNP concentrations increase in association with heart disease and reflect disease severity and prognosis. Furthermore, plasma NT-pro BNP has the potential to distinguish between heart failure and respiratory disease in humans and small animals. Determination of BNP in dogs has recently become widely used in clinical settings to diagnose heart disease.

Plasma BNP/NT-proBNP may be increased in dogs with myxomatous mitral valve disease, congestive heart failure (CHF), or occult dilated cardiomyopathy, and are useful in the differential diagnosis of CHF in dogs with cough or dyspnea.

We hypothesized that Greyhounds have Plasma BNP/NT-proBNP concentrations higher than non-Greyhound dogs, and that a separate reference range should be established for Greyhounds.

MATERIALS AND METHOD

An index patient, a healthy Greyhound, had high plasma NT-proBNP concentration, so we prospectively compared NT-proBNP concentrations in 24 retired racing Greyhounds with those in 27 age-matched non-Greyhound dogs.

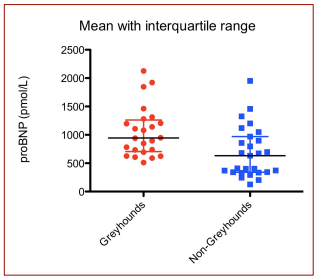


Plasma NT-proBNP concentration was measured using a commercially available assay (Cardiopet® proBNP, IDEXX Laboratories, Westbrook, ME, USA). Blood samples were collected into EDTA tubes and centrifuged within 30 minutes of collection; plasma was then placed into stabilizer tubes, frozen at -30°C, and shipped overnight to the reference laboratory.

Statistical analysis: A commercially available statistical software was used for statistical analysis. Descriptive statistics were performed and the D'Agostino & Pearson omnibus test was used to evaluate for normality. The variables were normally distributed and were compared using an independent samples t-test; results are reported as mean ± SD. Values of $P \leq 0.05$ were considered significant.

RESULTS

The plasma NT-proBNP concentration in Greyhounds were significantly higher than in non-Greyhound dogs (p=0.0004). Greyhounds had a mean NT-proBNP concentration of 1051 pMol/L; SD 439 pMol/L, and non-Greyhounds a mean of 684 pMol/L; SD 446 pMol/L. Fourteen Greyhounds had results above 900 pMol/L, which is the cutoff below which dogs with clinical signs would be considered unlikely to have heart disease.



CONCLUSION

Greyhounds have a reference range for plasma NT-proBNP concentrations that differs from that of other previously published reference ranges for dogs.

Although unlikely, the high plasma BNP concentration in normal Greyhounds could indicate that these dogs have an undetermined underlying myocardial pathology. However, all Greyhounds in this study were healthy, had no arrhythmias on auscultation, and remained asymptomatic after completing the study.

Occasionally, plasma BNP concentration will be used to ascertain whether or not a Greyhound with a heart murmur and cardiomegaly has myocardial disease.

Consequently, a variable proportion of normal Greyhounds could be erroneously diagnosed as having myocardial disease based on the presence of a heart murmur, an apparently higher than normal VHS, and high plasma BNP concentration.

Until a broader database and more precise reference intervals can be established, caution should be exercised in interpreting NT-proBNP concentrations in Greyhounds with suspected cardiac disease since high plasma NT-proBNP may be another Greyhound idiosyncrasy.

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