LONG-TERM VARIABILITY OF SELECTED NOVEL RENAL BIOMARKERS IN HEALTHY DOGS

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Introduction

Many novel renal biomarkers have potential to diagnose chronic kidney disease at an early stage when treatment may still retard disease progression.(1) However, long-term variation of these markers, which is important for accurate interpretation of results, is mostly unknown. Therefore, the study's aim was to determine long-term variation of serum cystatin C (sCysC), urinary immunoglobulin G (uIgG), C-reactive protein (uCRP), neutrophil gelatinase-associated lipocalin (uNGAL) and retinol-binding protein (uRBP) in dogs.

Materials and Methods

In this 1.5-year study, blood and urine samples were collected from eight clinically healthy adult beagles at week 0, 12, 24, 36, 47, 56, 68 and 83. sCysC was measured by particle-enhanced nephelometric immuno-assay.(2) uIgG, uCRP, uRBP and uNGAL concentrations were determined using validated, commercially available ELISAs, and indexed to urinary creatinine (c).(3) Within- and between-dog variance components (VC) and within-dog coefficient of variations (CV), defined as ratio of the standard deviation over the mean, were determined.

Results

uCRP concentrations were under the detection limit for all healthy dogs. Within-dog VC for sCysC, uRBP/c and uIgG/c were smaller than the between-dog VC, while for uNGAL/c the within-dog VC was slightly higher than the between-dog VC. Mean ± standard error of the mean for sCysC, uRBP/c, uIgG/c and uNGAL/c was 0.15 ± 0.01 mg/L, 0.09 ± 0.01 mg/g, 12.47 ± 5.69 mg/g and 2.32 ± 0.75 µg/g, respectively. Within-dog CV for sCysC was smallest (8.1%) compared to uRBP/c, uIgG/c and uNGAL/c (33.7%, 88.1% and 87.2%, respectively).

Conclusion

sCysC shows the lowest long-term within-dog variation in comparison to urinary renal biomarkers. Nevertheless, because monitoring urinary markers is important for evaluating renal injury, it is noteworthy that, of the urinary markers, uRBP/c is least prone to individual variation. Researchers and veterinarians may need to take this wide range of intra-individual variability into account when interpreting these renal biomarkers concentrations.

References

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