**Urinary liver-type fatty acid binding protein and neutrophil gelatinase-associated lipocalin in hyperthyroid cats before and after radioiodine treatment.**

T. Kongtasai[1], E. Meyer[2] F. Mortier[1], L. Stammeleer[1], E. Vandermeulen[3], L. Duchateau[4], P. Defauw[1], S. Daminet[1]

[1]Small Animal Department, Ghent University, Merelbeke, Belgium
[2]Department of Pharmacology, Toxicology and Biochemistry, Faculty of Veterinary Medicine, Ghent University, Merelbeke, Belgium
[3]Department of Medical Imaging of Domestic Animals, Ghent University, Merelbeke, Belgium
[4]Biometrics Research Group, Ghent University, Merelbeke, Belgium

Progressive azotemia can occur in cats after radioactive iodine treatment of hyperthyroidism. This process can contribute to reduced survival times in cats with iatrogenic hypothyroidism. Effective parameters to predict progressive azotemia in feline hyperthyroidism are lacking. Liver-type fatty acid binding protein (L-FABP) and neutrophil gelatinase-associated lipocalin (NGAL) are promising biomarkers for detection of early kidney insult in humans and cats. The objective of this study was to assess urinary L-FABP (uL-FABP) and urinary NGAL (uNGAL) in hyperthyroid cats before and after radioiodine treatment.

Blood and urine samples from 49 cats at 3 different time points i.e. before (T0) (n=49), 1 month after (T1) (n=49) and 11-29 months (T2) (n=26) after radioiodine treatment were analysed. Urinary L-FABP-to-creatinine ratio (uL-FABP/Cr) and urinary NGAL-to-creatinine ratio (uNGAL/Cr) were compared between T0, T1 and T2 using Wilcoxon signed-rank test using median [min-max] values. Correlations between uL-FABP/Cr or uNGAL/Cr and serum creatinine (sCr), total thyroxine (TT4) and glomerular filtration rate (GFR) using plasma exogenous Cr clearance test were determined for all time points together using Spearman's correlation.

Urinary L-FABP/Cr significantly decreased from T0 to T1 (n=49; 0.88 [0.03-896.00] versus 0.20 [0.03-2.40] µg/g, respectively; *P*<.001) and from T0 to T2 (n=26; 0.68 [0.03-896.00] versus 0.19 [0.02-76.41] µg/g, respectively; *P*<.001). Urinary L-FABP was detectable in 40/49 cats at T0, 11/49 at T1 and 14/26 cats at T2. There was no significant change of uNGAL/Cr between time points. Of 26 cats followed from T0 to T2, only 2 cats were azotemic at T2. The first of these cats had markedly high uL-FABP/Cr at T0 (270.86 µg/g), and remained at the highest uL-FABP/Cr value of all 26 cats at T2 (76.41 µg/g), while the second azotemic cat had relatively low uL-FABP/Cr both at T0 (0.88 µg/g) and T2 (0.17 µg/g). There were a moderate and significant correlation between uL-FABP/Cr and TT4 (*rs*=.33; P<.001) and between uL-FABP/Cr and GFR (*rs*=.49; P=.003). Serum Cr was negatively correlated with uL-FABP/Cr (*rs*=-.28; *P*=.001). Urinary NGAL/Cr was not correlated with sCr, TT4, and GFR.

Urinary L-FABP is upregulated in hyperthyroid cats suggesting ischemic/oxidative stress in feline kidneys during hyperthyroidism. However, uL-FABP is not present in all hyperthyroid cats and resolved when euthyroidism was obtained. Therefore, the ability of uL-FABP to predict progressive azotemia in hyperthyroid cats remains unclear. Also,

uNGAL is not a reliable biomarker for the detection of early kidney injury in hyperthyroid cats.

## Disclosures

No disclosure to report