The incidence and trends of proteinuria in cats receiving toceranib phosphate

Kimberly Williams, Arata Matsuyama*

Department of Small Animal Clinical Sciences, Western College of Veterinary Medicine, University of Saskatchewan, Saskatoon, SK, Canada

BACKGROUND

What is toceranib phosphate?

- A tyrosine kinase inhibitor that exerts antitumor effects by hindering tumor cell proliferation and angiogenesis.
- Toceranib is an orally bioavailable drug and frequently used to treat malignancies in cats

What are the side effects in cats?

- The side effects of toceranib phosphate in cats have not been well-characterized.
- Mild to moderate myelosuppression, GI signs, azotemia and hepatotoxicity were reported as possible side effects (n=69)[1,2].

What are the challenges?

- While **proteinuria and hypertension are recognized side effects** of toceranib phosphate in dogs[3,4], their **incidence in cats remains unknown**.
- Cats may exhibit increased susceptibility to developing proteinuria as a side effect of toceranib phosphate, considering the relatively higher prevalence of renal diseases in geriatric cats compared to canines.

OBJECTIVE

This study consists of two objectives:

1. To report the **incidence and trends** of proteinuria, hypertension and renal toxicities, and
2. To identify **risk factors** of those side effects in cats receiving toceranib phosphate.

MATERIALS & METHODS

Study design:

A single institutional retrospective study at Western College of Veterinary Medicine from January 2010 to January 2023.

Inclusion criteria:

Cats treated with toceranib phosphate; urinalysis and urine protein creatinine ratio (UPCR) measurements at 4 weeks (T1) and 8 weeks (T2) after starting toceranib phosphate.

Exclusion criteria:

Cats with concurrent lower urinary tract disease including urinary tract malignancy

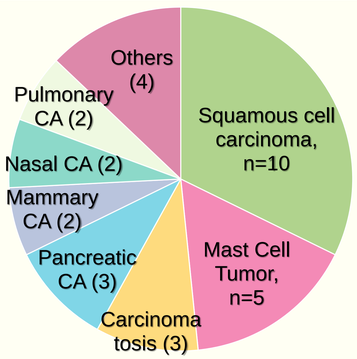
Analysis:

Descriptive statistics; Friedman's ANOVA for comparison of variables between three timepoints; Spearman test for correlation analysis between treatment duration and variables.

RESULTS

Patient / Disease demographics

Sex	20 MC; 12 FS
Age	Median 13 yo (range 2-19 yo)
Weight	Median 4.5 kg (range 2.6-8.3 kg)
Concurrent	NSAIDs 46.8%; Steroids 6.3%
Baseline	**UPCR↑ 12.5% (n=4)** **MAP↑ 15.6% (n=5)** **Azotemia 40.6% (n=13)**

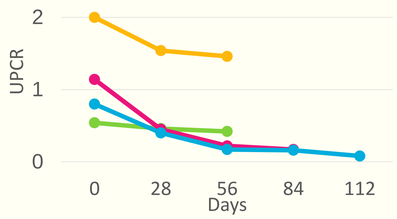


Treatments / Follow-up

- Palladia dose: 2.68 mg/kg M-W-F (range 1.7-3.9 mg/kg)
- Median treatment duration: 8 weeks (range: 8-42 weeks)

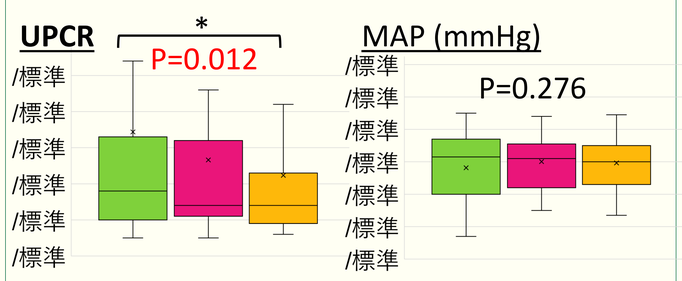
Proteinuria

- **0% (0/28)** cats developed proteinuria
- **0% (0/4)** cats with baseline proteinuria developed progressive increase in UPCR



UPCR trend of 4 cats with baseline proteinuria

- **UPCR** was significantly **lower** on **Day 56** than baseline (p=0.012)
- Serum Crea was significantly **lower** on **Day 28** and **Day 56** than baseline (p=0.001)



- No correlation was present between UPCR and toceranib treatment duration (p=0.089)

CONCLUSION

- The incidence of proteinuria in cats treated with toceranib appears to be low (<3.1%).
- Toceranib may be a viable treatment option even in cats with pre-existing proteinuria, as long as careful monitoring of trends is performed.

REFERENCES

1. Harper et al., *J Feline Med Surg*. 2017 Jun;19(6):619-623.
2. Merrick et al., *Vet Comp Oncol*. 2017 Sep;15(3):710-717.
3. Tjostheim et al., *J Vet Intern Med*. 2016 Jul-Aug; 30(4): 951–957.
4. Piscoya et al., *Can Vet J*. 2018 Jun;59(6):611-616.