

LIMITATIONS AND USAGES OF CEFOVECIN IN ZOOLOGICAL PRACTICE

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The 3rd generation cephalosporin cefovecin (Convenia, Pfizer) has an exceptionally long elimination half-life in dogs and cats, giving rise to a 14 day treatment interval in these species (STEGEMANN et al., 2006 a, b). Long treatment intervals are highly desirable in many exotic species in which oral medication is difficult and daily injections may be stressful and/or logistically difficult. However, pharmacokinetic profiles may differ greatly among species potentially leading to treatment failure, toxicity or development of antibiotic resistance.

Table 1: Theoretical cefovecin treatment intervals (Txi) in selected species based on a MIC of 1 µg/ml, a dose of 10 mg/kg cefovecin, and data from clinical trials or controlled studies.

Species	Scientific name	n	Likely Txi	Ref*
Scarlet ibis	<i>Eudocimus ruber</i>	2	≈ 2h	1
African grey parrot	<i>Psittacus erithacus</i>	1	< 2h	1
Blue-fronted amazon	<i>Amazona aestiva</i>	2	< 2h	1
Laughing dove	<i>Streptopelia senegalensis</i>	1	< 2h	+
Domestic chicken	<i>Gallus gallus</i>	8	≈ 1h	1
Russian tortoise	<i>Testudo horsfieldii</i>	1	< 24h	1
Spur-thighed tortoise	<i>Testudo graeca</i>	1	< 24h	1
Russian ratsnake	<i>Elaphe schrenckii</i>	2	≈ 24h	1
Boa constrictor	<i>Boa constrictor</i>	1	≈ 24h	1
Central bearded dragon	<i>Pogona vitticeps</i>	1	> 24h	1
Green iguana	<i>Iguana iguana</i>	16	≈ 15h	1
Ring tailed lemur	<i>Lemur catta</i>	1	> 5d	+
Geoffroy's spider monkey	<i>Ateles geoffroyi</i>	1	< 48h	+
Rhesus macaques	<i>Macacca mulatta</i>	2	≈ 24h	+
Domestic dog	<i>Canis familiaris</i>	12	14d	3
Domestic cat	<i>Felis catus</i>	12	14d	2
Caracal lynx	<i>Felis caracal</i>	3	≈ 10d	+
Amur tiger	<i>Panthera tigris</i>	1	> 14d	+
African lion	<i>Panthera leo</i>	3	≈ 10d	+
Domestic goat	<i>Capra hircus</i>	1	< 24h	+
Soemmerring's gazelle	<i>Nanger soemmerringii</i>	1	< 24h	+
Rheem gazelle	<i>Gazella subgutturosa marica</i>	1	< 24h	+
Speke's gazelle	<i>Gazella spekei</i>	1	< 24h	+
Domestic pig	<i>Sus scrofa</i>	1	> 5d	+

* 1 = THUESEN et al., 2009; 2 = STEGEMANN et al., 2006a; 3 = STEGEMANN et al., 2006b; + = Unpublished data

In a series of experiments and clinical trials, we investigated pharmacokinetic parameters for cefovecin in multiple species following a single treatment (10 mg/kg, body weight).

Full pharmacokinetic profiles were generated in chickens and green iguanas (THUESEN et al., 2009); kinetics were characterised by rapid absorption and the mean plasma half-life for cefovecin was 52 ± 16 min (0.9 ± 0.3 hrs) for hens and 3.9 hrs in green iguanas.

Results of brief elimination studies (Tab. 1) in 9 additional species of birds and reptiles, as well as 4 species of ruminants and 2 species of primates were similar to those seen in chickens and green iguanas. In contrast, 3 feline species, ring tailed lemurs, and domestic swine showed much longer half lives. No clinical signs of adverse effects were detected in any species.

Based on these findings, cefovecin may be effective with long treatment intervals (5 - 14 days) in exotic felids and possibly lemurs and pigs, but is not suitable for long dosing interval treatment in birds, reptiles, ruminants or primates.

References

- STEGEMANN MR, SHERINGTON J, BLANCHFLOWER S (2006a). Pharmacokinetics and pharmacodynamics of cefovecin in dogs. *J Vet Pharmacol Ther* **29**, 501 - 511.
- STEGEMANN MR, SHERINGTON J, COATI N, BROWN SA, BLANCHFLOWER S (2006b). Pharmacokinetics of cefovecin in cats. *J Vet Pharmacol Ther* **29**, 513 - 524.
- THUESEN LR, MF BERTELSEN, L BRIMER, MT SKAANILD (2009). Selected pharmacokinetic parameters for Cefovecin in hens and green iguanas. *J Vet Pharmacol Ther* **32**, 613 - 617.