MiraVista
VETERINARY DIAGNOSTICS

CLINICAL TREATMENT & MONITORING

Posaconazole and Voriconazole – Treating Invasive Fungal Infections in Small Animals

Background

Posaconazole and voriconazole are next generation azoles most closely related to itraconazole and fluconazole, respectively. As compared with the prior generation azoles, posaconazole and voriconazole are more active against molds (Asper) and yeasts (Crypto) with good activity against enzootic dimorphic fungi (Blasto, Histo, Cocci). They are approved by the FDA for the prevention (posa-) or treatment (vori-) of invasive aspergillosis in humans. Posaconazole is also labeled for the prevention of invasive candidiasis. Voriconazole is also labeled for the treatment of invasive candidiasis and invasive mold infections caused by *Scedosporium* or *Fusarium*.

U.S. patent protections have expired for both drugs and FDA approved generic formulations are now available. This has greatly decreased the price, making them financially feasible treatment options for some animals.

Formulations

Drug	Formulation	Dose	Innovator v Generic
Posaconazole (Noxafil®)	Solution	40 mg/ml	No Generic available
	Tablet	100 mg extended release	Generic available
Voriconazole (Vfend®)	Solution	40 mg/ml	Generic available
	Tablet	50, 200 mg	Generic available

Clinical Uses

Use	Organisms	Notes
Invasive Mold Infection	Asper, Mucor, Fusarium, other molds	Consider combination therapy with terbinafine (30-40 mg/kg/day)
Salvage Therapy	Blasto, Histo, Cocci, Crypto, Candida	When first line therapy has failed after 2-3 months of treatment.

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Adverse-Effects

As with any azole, hepatoxicity and gastrointestinal upset are possible. Liver enzyme activity should be monitored 3-4 weeks after starting the drug then every 1-6 months during treatment, pending duration of treatment and clinical findings. Voriconazole can cause neurotoxicity in cats [1]. This was described in early studies when high doses were used. A more recent pharmacokinetic study showed that much lower doses might be effective and greatly decrease the chance of neurotoxicity [2].

Drug-to-Drug Interactions

Azoles work by inhibition of a fungal CYP 450 enzyme affecting ergosterol synthesis important for integrity of the cell wall. Azoles are effective because they are relatively specific to fungal CYP 450 enzymes. Lesser mammalian CYP 450 enzyme inhibition still occurs. Since these are metabolic enzymes, inhibition can lead to increased blood levels of drugs administered concurrently. Very few of these have been studied directly in dogs or cats. Increased blood levels of the following drugs are possible - amitriptyline, amlodipine, benzodiazepines, cisapride, corticosteroids, cyclosporine, ivermectin, and macrolide antibiotics.

Recommended Dosages

Drug	Species	Formulation	Dose	Route
Posaconazole	Dog	Tablet ER	5 mg/kg EOD	PO
		Solution	5 mg/kg BID	
	Cat	Solution	15 mg/kg once then 7.5 mg/kg/day	
Voriconazole	Dog	Tablet or Solution	5 mg/kg BID	PO
	Cat	Solution	12.5 mg (total dose) q 72 h	

Therapeutic drug monitoring should be considered for both drugs.

Estimated Monthly Costs

Drug	Species (weight)	Formulation	Cost (USD)
Posaconazole	K9 (20 kg)	100 mg Tablet ER	257
	Feline (5 kg)	40 mg/ml Solution	457
Voriconazole	K9 (20 kg)	200 mg Tablet	103
	Feline (5 kg)	40 mg/ml Solution	37

Prices vary. Cost for generic drugs based on lowest GoodRx price (May 2021). Cost for posaconazole solution is based on CVS price (May 2021).

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REFERENCES:

1. Quimby JM, Hoffman SB, Duke J, et al. *Adverse neurologic events associated with voriconazole use in 3 cats*. J Vet Intern Med 2010;24:647-649.

2. Vishkautsan P, Papich MG, Thompson GR, 3rd, et al. *Pharmacokinetics of voriconazole after intravenous and oral administration to healthy cats*. Am J Vet Res 2016;77:931-939.

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