

Antitherpetic Drugs in Equine Medicine



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KEYWORDS

- Equine • Herpesvirus • EHV-1 • EHV-5 • Antiviral • Nucleoside analogs • Acyclovir
- Valacyclovir

KEY POINTS

- Equine herpesvirus (EHV)-1 differentially affects different classes of horses but can be particularly devastating to neonatal foals, pregnant mares, and adult performance horses.
- Recent high-profile outbreaks of EHV myeloencephalopathy (EHM) have had an impact on the equine industry and stimulated interest in antitherpetic interventions.
- Several antitherpetic drugs that are active against EHV-1 in the laboratory have been investigated both clinically and experimentally in horses and foals.
- The recent association between equine pulmonary multinodular fibrosis (EMPF) and EHV-5 has resulted in the empiric use of antitherpetic drugs for this condition.
- Little is currently known about resistance patterns of EHV-1 or EHV-5 for antitherpetic drugs in horses.

INTRODUCTION

Herpesviruses comprise a large, ancient family of viruses that infect most if not all vertebrates and even lower organisms.¹ The herpesviruses are specialists that have coevolved with their host species over many years, evading multiple steps of immunity.² Perhaps as a consequence of this immune evasion, current equine vaccines can decrease the replication and clinical signs associated with several herpesvirus infections but cannot completely prevent infection.^{3–6} Currently, 9 herpesviruses have been described from equids and are appropriately named EHV-1 through EHV-9.¹ These 9 herpesviruses belong to 2 separate subfamilies, either the Alphaherpesvirinae (EHV-1, EHV-3, EHV-4, EHV-6, EHV-8, and EHV-9) or the Gammaherpesvirinae (EHV-2, EHV-5, and EHV-7). Several of these viruses, such as EHV-1, EHV-2, EHV-3, EHV-4, and EHV-5, are associated with clinical disease in horses. Whereas in vitro antitherpetic drug susceptibility testing (**Table 1**) has been performed with EHV-1, EHV-3,

The author has nothing to disclose.

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Vet Clin Equine 33 (2017) 99–125

<http://dx.doi.org/10.1016/j.cveq.2016.12.002>

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Table 1
In vitro half-maximal inhibitory concentration values of antiherpetic drugs for equine herpesviruses

Virus	Drug	Virus Strain	Cell Type	Half-maximal Inhibitory Concentration (µg/mL)	Reference
EHV-1	Acyclovir	Rac-H, H-45	PK13	0.45	Rollinson & White, ⁸⁵ 1983
		Kentucky D	PRK	7	De Clerq et al, ¹⁰⁹ 1986
		Quai Hais	R13	2.6	Boyd et al, ⁶⁰ 1987
		94P247, 97P70, and 99P96; 97P82, 99P136, and 03P37	EEL	1.7–3	Garre et al, ⁸⁴ 2007
		89c25	RK13	2.3–3.1	Azab et al, ⁸² 2010
		T953 (Findlay OH 2003)	ELF	11.4 ± 1.5	(Maxwell LK, Bentz BG, Gilliam LL, et al. Efficacy of the early administration of valacyclovir for the therapy of neuropathogenic EHV-1 in horses. Submitted for publication.)
		T953 (Findlay OH 2003)	PBMC	0.8	(Maxwell LK, Bentz BG, Gilliam LL, et al. Efficacy of the early administration of valacyclovir for the therapy of neuropathogenic EHV-1 in horses. Submitted for publication.)
	Penciclovir	Quai Hais	R13	1.6	Boyd et al, ⁶⁰ 1987
		AB4	RK13	1.3–1.9	de la Fuente et al, ⁷⁶ 1992
		T953 (Findlay OH 2003)	ELF	4.8 ± 0.7	(Maxwell LK, Bentz BG, Gilliam LL, et al. Efficacy of the early administration of valacyclovir for the therapy of neuropathogenic EHV-1 in horses. Submitted for publication.)
	Ganciclovir	Rac-H, H-45	PK13	0.02	Rollinson and White, ⁸⁵ 1983
		Kentucky D	E Derm	0.03	Smith et al, ¹¹⁰ 1983
		Rac-H, H-45	RK13	0.02–0.1	Rollinson, ¹¹¹ 1987
		94P247, 97P70, and 99P96; 97P82, 99P136, and 03P37	EEL	0.1–4	Garre et al, ⁸⁴ 2007
		89c25	RK13	0.1–0.7	Azab et al, ⁸² 2010

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