

Glaucoma in Pet Rabbits

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In the literature

Yuschenkoff D, Graham J, Pumphrey SA. Diagnosis and treatment of glaucoma in client-owned rabbits (*Oryctolagus cuniculus*): 16 eyes from 11 rabbits (2008-2019). *J Exotic Pet Med.* 2020;34:67-71.

FROM THE PAGE ...

It has been anecdotally suggested that rabbits have a high prevalence of ophthalmologic disorders, and this species has been studied extensively as a model for human glaucoma. However, there is a paucity of information available regarding the etiology, diagnosis, and treatment of glaucoma in pet rabbits.

Glaucoma in pet rabbits can be primary (ie, congenital) or secondary to cataracts, uveitis, or other ocular disease. Clinical signs may include loss of vision, buphthalmia, corneal edema, elevated IOP, optic nerve head cupping, mydriasis, and cataract formation. Physical examination findings may include corneal disease, blepharitis, conjunctivitis, mydriasis, hyphema, and cataracts.

A thorough ophthalmologic examination, including IOP measurement, is the most important diagnostic test for glaucoma screening.

This study retrospectively reviewed records of pet rabbits diagnosed with glaucoma by a board-certified veterinary ophthalmologist or ophthalmology resident over an 11-year period. Glaucoma was diagnosed in 16 eyes of 11 rabbits. Median intraocular pressure (IOP) at diagnosis was 39 mm Hg (range, 26-55 mm Hg). Reference ranges for IOP in rabbits have been reported, with a mean IOP of 9.51 ± 2.62 mm Hg using a rebound tonometer and 15.44 ± 2.16 mm Hg using an applanation tonometer.¹

Treatment of glaucoma in this study included topical medication (eg, dorzolamide, timolol) to reduce IOP. Ten eyes from 7 rabbits were refractory to initial medical management, although 2 showed progressive IOP reduction with continued use of topical medication. Of the remaining 5 rabbits that did not respond to initial medical management, 2 underwent unilateral enucleation and 3 received intravitreal gentamicin injections.



... TO YOUR PATIENTS

Key pearls to put into practice:

- 1** A thorough ophthalmologic examination, including IOP measurement, is the most important diagnostic test for glaucoma screening. A definitive diagnosis for glaucoma requires measurement of consistently elevated IOP in one or both eyes. Blood work (ie, CBC and serum chemistry profile) is useful for evaluating systemic health and determining whether a patient may be an acceptable candidate for surgery. Imaging (eg, skull radiography, computed tomography) is an excellent diagnostic tool for evaluating the skull, orbits, inner ear canals, and bullae.
- 2** Topical medication to reduce IOP is a good first treatment in rabbits with glaucoma. Monitoring for treatment response should include regular ophthalmologic examinations and IOP measurements.
- 3** Surgical enucleation may become necessary if the glaucoma is refractory to medical treatment. Enucleation can provide an improved quality of life for the rabbit through reduction or elimination of ocular pain.
- 4** Pain assessment and management is an important aspect of clinical care for rabbits with glaucoma. Because rabbits are a prey species, pain may be hard to assess. Pet owners should be informed how to monitor for pain, including observing for signs such as abnormal posture or decreased food intake and social interaction.

Reference

1. Pereira FQ, Bercht BS, Soares MG, da Mota MGB, Pigatto JAT. Comparison of a rebound and an applanation tonometer for measuring intraocular pressure in normal rabbits. *Vet Ophthalmol*. 2011;14(5):321-326.

Suggested Reading

- Varga M. *Textbook of Rabbit Medicine*. 2nd ed. Butterworth Heinemann Elsevier; 2013.
- Percy DH, Barthold SW. *Pathology of Laboratory Rodents and Rabbits*. 2nd ed. Iowa State University Press; 2001.

Brief Summary: Before using NexGard[®] (afoxolaner) Chewables, please consult the product insert, a summary of which follows.

CAUTION: Federal (USA) law restricts this drug to use by or on the order of a licensed veterinarian.

Description: NexGard is a soft chewable for oral administration to dogs and puppies according to their weight. Each chewable is formulated to provide a minimum afoxolaner dosage of 1.14 mg/lb (2.5 mg/kg).

Indications: NexGard kills adult fleas and is indicated for the treatment and prevention of flea infestations (*Ctenocephalides felis*), and the treatment and control of *Ixodes scapularis*, *Dermacentor variabilis*, *Amblyomma americanum*, and *Rhipicephalus sanguineus* infestations in dogs and puppies 8 weeks of age and older, weighing 4 pounds of body weight or greater, for one month. NexGard is indicated for the prevention of *Borrelia burgdorferi* infections as a direct result of killing *Ixodes scapularis* vector ticks.

Dosage and Administration: NexGard is given orally once a month, at the minimum dosage of 1.14 mg/lb (2.5 mg/kg). See full product insert for dosing table and details.

Warnings: Not for use in humans. Keep this and all drugs out of the reach of children. In case of accidental ingestion, contact a physician immediately. Keep NexGard in a secure location out of reach of dogs, cats, and other animals to prevent accidental ingestion or overdose.

Precautions: Afoxolaner is a member of the isoxazoline class. This class has been associated with neurologic adverse reactions including tremors, ataxia, and seizures. Seizures have been reported in dogs receiving isoxazoline class drugs, even in dogs without a history of seizures. Use with caution in dogs with a history of seizures or neurologic disorders.

The safe use of NexGard in breeding, pregnant or lactating dogs has not been evaluated.

Adverse Reactions: In a well-controlled US field study, which included a total of 333 households and 615 treated dogs (415 administered afoxolaner; 200 administered active control), no serious adverse reactions were observed with NexGard.

Over the 90-day study period, all observations of potential adverse reactions were recorded. The most frequent reactions reported at an incidence of > 1% within any of the three months of observations are presented in the following table.

Table 1: Dogs with Adverse Reactions.

	Treatment Group			
	Afoxolaner		Oral active control	
	N ¹	% (n=415)	N ²	% (n=200)
Vomiting (with and without blood)	17	4.1	25	12.5
Dry/Flaky Skin	13	3.1	2	1.0
Diarrhea (with and without blood)	13	3.1	7	3.5
Lethargy	7	1.7	4	2.0
Anorexia	5	1.2	9	4.5

¹ Number of dogs in the afoxolaner treatment group with the identified abnormality.

² Number of dogs in the control group with the identified abnormality.

In the US field study, one dog with a history of seizures experienced a seizure on the same day after receiving the first dose and on the same day after receiving the second dose of NexGard. This dog experienced a third seizure one week after receiving the third dose. The dog remained enrolled and completed the study. Another dog with a history of seizures had a seizure 19 days after the third dose of NexGard. The dog remained enrolled and completed the study. A third dog with a history of seizures received NexGard and experienced no seizures throughout the study.

Post-Approval Experience (July 2018): The following adverse events are based on post-approval adverse drug experience reporting. Not all adverse events are reported to FDA/CVM. It is not always possible to reliably estimate the adverse event frequency or establish a causal relationship to product exposure using these data.

The following adverse events reported for dogs are listed in decreasing order of reporting frequency for NexGard: Vomiting, pruritus, lethargy, diarrhea (with and without blood), anorexia, seizure, hyperactivity/restlessness, panting, erythema, ataxia, dermatitis (including rash, papules), allergic reactions (including hives, swelling), and tremors.

Effectiveness: See full product insert for details regarding Effectiveness.

Animal Safety: In a margin of safety study, NexGard was administered orally to 8 to 9-week-old Beagle puppies at 1, 3, and 5 times the maximum exposure dose for a total of six treatments. There were no clinically-relevant effects related to treatment on physical examination, body weight, food consumption, clinical pathology (hematology, clinical chemistries, or coagulation tests), gross pathology, histopathology or organ weights. Vomiting occurred throughout the study, with a similar incidence in the treated and control groups, including one dog in the 5x group that vomited four hours after treatment.

In a well-controlled field study, no adverse reactions were observed from the concomitant use of NexGard with other medications.

Contact Information: For a copy of the Safety Data Sheet (SDS) or to report suspected adverse drug events, contact Boehringer Ingelheim Animal Health USA Inc. at 1-888-637-4251. For additional information about adverse drug experience reporting for animal drugs, contact FDA at 1-888-FDA-VETS or www.fda.gov/reportanimalae.

The information provided here is not comprehensive. The full FDA-approved product insert is available at www.nexgardfordogs.com. Consult your veterinarian for further information.

Product approved by FDA under NADA # 141-406

Marketed by: Frontline Vet Labs™, a Division of Boehringer Ingelheim Animal Health USA Inc. Duluth, GA 30096

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