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A Look at Equine Recurrent Uveitis and Leptospirosis

A "hot" eye—one that is cloudy and irritated with a constricted pupil—is a true emergency. One of its causes, a particularly nasty bacterial uveitis, can cause eventual blindness in 50-100% of its victims especially in Appaloosa's. Thus, a veterinarian's prompt assessment and treatment are crucial.

"A 'hot' eye is a classic presentation for a horse with uveitis, or inflammation of the middle layer of the eye called the uvea," said Ann Dwyer, DVM, of Genesee Valley Equine Clinic, in Scottsville, New York, at the 2015 American Association of Equine Practitioners Convention, held Dec. 5-9 in Las Vegas.

During a Sunrise Session brought to attendees by Zoetis, Dwyer reminded equine veterinarians about the key features of the inner eye and how they relate to a "privileged" area of the body because of the blood-ocular barrier. The horse's body essentially perceives all proteins and other cellular antigens (substances the immune system produces antibodies against) inside the eye as nonself, or, "in other words, molecules that the immune system would classify as foreign and react to," she said.

In cases of uveitis, the blood-ocular barrier becomes leaky and, "All bets are off! Immune cells, T cells specifically, flood into the eye and essentially go crazy, causing damage and inflammation because so many structures deep to the urea look foreign," said Dwyer.

Affected eyes are painful, blepharospastic (winking due to involuntary eyelid muscle contraction), teary, and sensitive to light. In some cases the horse has a flare (cloudy appearance); blood vessels become obvious on the cornea, and there is a green/orange tint to the fundus (back of the eye).

"When equine veterinarians see a 'hot eye' with miosis, they should immediately be thinking uveitis, if examination fails to reveal another cause, such as a corneal ulcer or a corneal stromal abscess." said Dwyer.

In cases of acute uveitis, regulatory cells eventually come in and gain control over the T cells that are wreaking havoc. This temporarily quiets the eye, but months later, it's common for the eye to flare up again.

"At some point, we change our diagnosis from acute uveitis to recurrent uveitis, because there are periods of quiescence interspersed with periods of apparent acute uveitis—a condition more widely named equine recurrent uveitis (ERU)," said Dwyer.

This the leading cause of blindness in horses, affecting 1-2% of the equine population. ERU can occur in one or both eyes, and the cause is often never identified (called idiopathic ERU). That said, researchers and veterinarians believe that pathogenic servovars (forms) of bacteria in the genus Leptospira (*L. pomona* and *L. grippotyphosa*) are associated with more than 60% of ERU cases.

Several wildlife and domestic species, including deer, rats, raccoons, cattle, and pigs, serve as reservoir hosts for the bacteria. Those animals spread the bacteria through urine, which horses can ingest if they drink contaminated water, such as standing water in pastures. The bacteria then enter the bloodstream and colonize and multiply in the kidneys before spreading to the eye.

Veterinarians can overlook acute (sudden-onset) leptospirosis cases. The fever and associated clinical signs are mild and of such short duration that most owners don't even realize their horse is sick. Although the organism usually clears the kidneys within several weeks, it's not until months later that the infection rears its ugly head in the form of uveitis.

"One of the most frustrating aspects of leptospiral-associated uveitis, often abbreviated as LRU, a form of ERU, is that the eye often settles down all on its own with or without treatment, lulling owners into a false sense of security," said Dwyer.

Over time, the affected eye seems to get caught in a frustrating cycle: Inflame, damage, repeat. And, just like a domino effect, once it starts it doesn't stop.

"With repeated episodes of inflammation, calcium deposits can form on the cornea, and up to one-quarter of all ERU horses experience secondary corneal ulcers at some point as a result of self-trauma related to pain or vision loss," said Dwyer. "Some horses develop cataracts, lens luxation (detachment), glaucoma (increased pressure in the eye), intraocular hemorrhage, and retinal detachment resulting in acute blindness."

Any horse is theoretically at risk for leptospiral-associated uveitis (LAU), but Appaloosas drew the short straw.

"Appaloosas seem to develop particularly severe disease if they are exposed to pathogenic leptospiral bacteria," Dwyer said. "This may be due to the fact that certain genetic lines of the breed are at high risk *(right)* times that of the general horse population for developing a different type of uveitis—an insidious (slowly progressive), persistent form that causes a high rate of ocular degeneration and blindness."

The goal when treating LAU-affected horses is to maintain their vision and comfort by decreasing ocular inflammation; however, this goal is an elusive one. Non-Appaloosas affected with LAU have about a 50% chance of losing vision over time, whereas Appaloosas have almost a 100% guarantee of eventual vision loss.

Treatment with topical and sometimes systemic steroids, coupled with a topical mydriatic (use to dilate the pupil) and systemic non-steroidal anti-inflammatories (NSAIDs), might stave off permanent damage for the short term, but recurrent episodes bring changes that still rob horses of vision more often than not.

Prevention is the only protection against LAU. To date, some equine veterinarians had administered the leptospirosis multivalent bacterin vaccine licensed for cattle to at-risk horses because there was no other option. Dwyer said anecdotal reports suggest that in some instances this practice has reduced the incidence of new cases, but the use of the bovine vaccine was off-label, and safety data was lacking. She added that a new equine leptospirosis vaccine, recently brought to market by Zoetis, gives owners the opportunity to try to prevent disease on at-risk farms in horses that have never been exposed to the bacteria.

The product is a univalent bacterin manufactured from the *L. pomona* serovar and labeled to prevent the spread of *Leptospira* in the blood and urine (leptospiremia and leptospiruria) in healthy horses. Results from studies performed by Zoetis have demonstrated that healthy hyperimmunized horses remained free of uveitis for up to one year following vaccination. That said, no challenge studies exist to see if fewer horses develop uveitis if they are exposed to pathogenic leptospiral bacteria following vaccination.

Many practitioners during Dwyer's presentation said they were cautious of administering a leptospiral vaccine to horses that have been diagnosed with ERU. Some attendees related stories that vaccination with any type of antigen has been associated with uveitis flares in some affected horses. Dennis Brooks, DVM, PhD, Dipl. ACVO*, from the University of Florida's College of Veterinary Medicine, commented on this, stating, "Vaccinating in the face of pre-existing ERU is like poking a bear."

Dwyer and others in the audience concurred, advising veterinarians to exercise caution when considering any kind of vaccine administration in the face of active ERU, including LAU. Dwyer also commented that some horses with severe ERU are best managed by avoiding all vaccination, and that flares may be avoided in other horses by choosing to vaccinate on a cases-by-case basis, carefully spacing vaccine administrations, and administering NSAIDs on immunization days.