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Dr. Regina Turner reported on reproduction topics during the 2018 Kester News Hour.



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AAEP Kester News Hour

This is part 1 of our coverage of the Kester News Hour, one of the favorite presentations at the 2018 AAEP Convention.

By Nancy S. Loving, DVM

One of the best-attended presentations at every AAEP Convention is the Kester News Hour, which features updates on current research and interesting journal papers about lameness, medicine and reproduction.

The 64th AAEP Convention was held in San Francisco, California. Robert MacKay, BVSC, PhD, DACVIM, reported on medicine topics; Regina Turner, VMD, DACT, reported on reproduction topics; and Wes Sutter, DVM, reported on surgery topics.

Equine Parvovirus

Following the death of a Nebraska horse 65 days after treatment with equine-derived tetanus antitoxin, Thomas Divers, DVM, DACVIM, DACVECC, and colleagues at Cornell University identified a new virus—equine parvovirus—in the horse's liver and serum as well as in the antitoxin used for treatment.

Parvovirus is known for its resistance to heat inactivation and solvent detergents, which are the processes used in the preparation of equine tetanus antitoxin, for example.

Clinical cases of equine parvovirus

(EqPV-H of the genus *Copiparvovirus* found in pigs, cows and sea lions) have resulted from blood product inoculations.

Incubation time to development of serum hepatitis from parvovirus takes six to 10 weeks, with some individuals taking as long as 14 weeks to develop—these time spans are considerably longer than most reported cases of serum hepatitis associated with tetanus antitoxin [Divers, T.J.; Tennant, B.C.; Kumar, A.; *et al.* New Parvovirus Associated with Serum Hepatitis in Horses After Inoculation of Common Biological Product.

Emerging Infectious Diseases Feb 2018, vol. 24, no. 2; pp. 303-310].

The Cornell team tested 100 horses and found antibody titers in 15 of them, with virus in the blood of 13. However, those with evidence of the virus did not develop biochemical evidence (for example, elevated GGT) of liver disease.

The report suggested that most horses infected with equine parvovirus do not develop clinical disease. This is comparable to previous data that Theiler's disease (serum hepatitis) only occurs in 1.4-2.2% of horses receiving equine blood products.

The study also noted that an infection with EqPV-H might persist despite the absence of clinical or biochemical changes and in the presence of antibodies. The researchers have no data about the ability of specific antibody to neutralize this virus.

This finding of the potential risk of parvovirus infection from blood products is an important consideration for veterinarians using equine serum or plasma products for horses.

Education of clients is important, as well, to avoid use of shared needles that could transfer potentially infective blood between horses.

Antibody to PNAG Protects Against Intracellular Pathogens

Rhodococcus equi is a difficult disease to manage because it is an intracellular organism that is difficult to target with antimicrobial therapy. Mare feces, the soil and air on farms are important sources for infection and colonization during the foaling season.

R. equi is associated with significant mortality rates in foals. Poly n-acetyl glucosamine (PNAG) is an important virulence determinant because it

surrounds pathogenic intracellular bacteria, fungi or protozoa, making it difficult to mount protective vaccination responses.

In a recent study, mares were given the PNAG antibody at six and three weeks prior to foaling. The PNAG antibody was administered to foals via colostrum per os or intravenously.

On Day 28, the study foals were challenged with intrabronchial *R. equi* and their responses were compared to foals that had not received the PNAG antibody [Cywes-Bentley, C.; Rocha, J.N.; Bordin, A.I.; Vinacur, M.; Rehman, S.; Zaidi, T.S.; *et al.* (2018) Antibody to Poly-N-acetyl glucosamine provides protection against intracellular pathogens: Mechanism of action and validation in horse foals challenged with *Rhodococcus equi*. *PLoS Pathog* 14(7): e1007160. <https://doi.org/10.1371/journal.ppat.1007160>].

The results were very encouraging: Of 12 PNAG-antibody protected foals with colostrum, a single foal developed pneumonia compared to pneumonia development in six of the seven control foals. None of the intravenous PNAG-antibody recipient foals developed pneumonia, whereas all four controls in that portion of the study developed clinical disease.

Overall, only one of 17 foals receiving PNAG antibody developed pneumonia compared to pneumonia development in 10 of 11 control foals.

Because PNAG antibody has been shown to protect against *R. equi*, the recommendation is to immunize pregnant mares prior to foaling.

The Use of a Sleeve-Style Ice Boot for Treating Equine Laminitis

Icing of the distal limb has been a recognized prevention for horses at risk of laminitis, such as during an attack of colitis, sepsis or grain overload.

Previous methods of continuous digital cryotherapy include immersion of the entire hoof within an ice boot

or slurry. The objective is to cool soft tissues to temperatures less than 10° C (50° F). This accomplishes a 50% reduction in metabolic demands of the tissues.

Studies using an endotoxemia model evaluated use of icing, but with different logistics [Burke, M.J.; Tomlinson, J.E.; Blikslager, A.T.; Johnson, A.L.; Dallap-Schaer, B.L. Evaluation of digital cryotherapy using a commercially available sleeve style ice boot in healthy horses and horses receiving i.v. endotoxin. *Equine Vet J* 2018 Nov; 50(6): 848-853. doi: 10.1111/evj.12842].

In one study, the limbs of eight horses were iced with a sleeve that extended from the carpus downward to the top of the coronary band and did not include the hoof. Thermocouples placed into the dorsal laminae recorded hoof temperature—the 10° C temperature objective was reached by 45 minutes and remained there for three hours. The opposite limb served as a control.

The study concluded that lamellar temperature decreases with use of an ice sleeve that does not include the hoof by cooling of arterial blood that circulates through the foot.

The second study using an ice boot that enclosed the hoof is a method comparable to hoof immersion within an ice slurry. The ice boot was used on 285 horses for a half-day for 13 days.

Despite reaching the temperature objective of 10° C, this method was fraught with side effects. Seven percent (20/285) of horses developed soft tissue injury; seven individuals (2.5%) experienced necrosis and/or cellulitis due to duration of ice contact.

Because inclusion of the hoof in an ice boot or sleeve puts soft tissues at risk of cryo injury, it is recommended to perform this procedure under careful observation to avoid adverse side effects. The modified technique that excludes direct hoof icing cools the lamellar tissues effectively with less risk of soft tissue injury to hoof structures. **EM**

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