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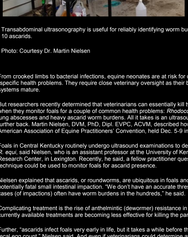
Monitoring Foal Ascarid Burdens With Ultrasonography



Transabdominal ultrasonography is useful for reliably identifying worm burdens of more than 10 ascarids.

Photo: Courtesy Dr. Martin Nielsen

From crooked limbs to bacterial infections, equine neonates are at risk for developing a number of age -specific health problems. They require close veterinary oversight as their bodies and immune systems mature.

But researchers recently determined that veterinarians can essentially kill two birds with one stone when they monitor foals for a couple of common health problems: *Rhodococcus equi* pneumonia and lung abscesses and heavy ascarid worm burdens. All it takes is an ultrasound probe moved a little further back. Martin Nielsen, DVM, PhD, Dipl. ECVPC, ACVM, described how to do just this at the 2015 American Association of Equine Practitioners' Convention, held Dec. 5-9 in Las Vegas.

Foals in Central Kentucky routinely undergo ultrasound examinations to detect lung lesions caused by *R. equi*, said Nielsen, who is an assistant professor at the University of Kentucky's Gluck Equine Research Center, in Lexington. Recently, he said, a fellow practitioner questioned whether the same technique could be used to monitor foals for ascarid presence.

Nielsen explained that ascarids, or roundworms, are ubiquitous in foals and put them at risk for potentially fatal small intestinal impaction. "We don't have an accurate threshold number, but clinical cases (of impactions) often have worm burdens in the hundreds," he said.

Complicating treatment is the rise of anthelmintic (dewormer) resistance in ascarids, meaning the currently available treatments are becoming less effective for killing the parasites.

Further, "ascarids infect foals very early in life, but it takes a while before they can be identified on fecal egg count," Nielsen said. And even if veterinarians could determine ascarid egg count with this method, it isn't very useful for determining the extent of an ascarid worm burden.

In other words, we need more diagnostic options. So Nielsen and colleagues took the veterinarian's query into consideration and sought to determine whether they could use ultrasound to identify worm burdens in foals.

Through two studies—one of 10 naturally infected foals and a second of 15 naturally infected foals—he and colleagues determined that ultrasonography is an effective approach for detecting ascarids in foals' abdomens, consistent with equine fecal egg counts when those were positive, but extending diagnostic capability beyond that window. The team also created a four-point scoring system, where Grade 1 reflects low to no evidence of ascarids and Grade 4 reflects evidence of a high roundworm burden, or a "parasite party," Nielsen said.

In the first study, the team determined that, when using Grade 2 as a cutoff value, ultrasonography was 100% predictive and specific for identifying roundworm burdens. They also learned that foals' fecal egg counts peaked at 4 to 5 months of age. While the ultrasound exam results followed the same trend, worms were still visible as fecal egg count numbers dropped.

Worms appear as double parallel white lines on ultrasound images, Nielsen said.

Photo: Courtesy Dr. Martin Nielsen

In the second study, the team tested the efficacy of ivermectin and oxibendazole in eliminating ascarids. Nielsen said an untreated control group's ultrasound scores stayed stable, while both the ivermectin and the oxibendazole groups' ultrasound scores declined.

Finally, the team evaluated the intra-observer (the same observer evaluating the same specimens) and inter-observer (different observers evaluating the same specimens) agreement in the dewormed foals—basically, determining how repeatable this approach is and with what precision—both of which were fair to moderate in the study, meaning most practitioners came to similar results.

Nielsen said he's held training sessions for practitioners in Central Kentucky on the technique and how to incorporate it into their practices. He said feedback from practitioners has been positive and includes:

- The parasite-focused ultrasound takes only five to 10 minutes to complete;
- Clipping and sedation hasn't been needed; and
- The worms were easy to spot on the ultrasound images.

Ultimately, Nielsen said he's proven transabdominal ultrasonography useful for reliably identifying worm burdens of more than 10 ascarids. As an added perk, it's a simple ad-on to the *R. equi* ultrasound exams that are already taking place for many foals.

"The decision to use this technique will have to depend on a cost-benefit assessment, where the cost of the procedure is considered relative to the risk of ascarid-associated disease in a given population of foals," Nielsen said. "Horse owners who have experienced a small intestinal ascarid impaction in one of their foals may be particularly motivated for setting up this kind of monitoring for a period of time to evaluate if chosen interventions have worked satisfactorily."