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Measuring SAA Can Help Identify Health Issues Early

In the early stages of infection or inflammation, it might be apparent that something isn't quite right with your horse, but for all intents and purposes, he's clinically normal—perhaps no fever, normal appetite. Such vague signs can delay diagnostic and treatment decisions, as the veterinarian opts for a "wait-and-see" approach, leaning on serial blood tests for clues.

Fortunately, an accurate and reliable indicator for infection is gaining traction in equine practice: serum amyloid A (SAA) concentration. Rose Nolen-Walston, DVM, Dipl. ACVIM, associate professor of large animal internal medicine at the University of Pennsylvania School of Veterinary Medicine's New Bolton Center, described its uses during the 2015 American Association of Equine Practitioners Convention, held Dec. 5-9 in Las Vegas.

Nolen-Walston explained that SAA is an inflammatory marker that the liver produces as part of the body's response to inflammation. Veterinarians can use it to differentiate between horses with systemic inflammation and those that have noninflammatory diseases.

Historically, veterinarians have relied primarily on another inflammatory marker, the protein fibrinogen, to identify infections in horses. All horses have a baseline level of fibrinogen in their bloodstream that rises slightly with inflammation. In contrast, SAA isn't present without inflammation, but levels rise into the thousands when significant infection sets in, Nolen-Walston said. Additionally, SAA levels rise and normalize much faster than fibrinogen, which allows veterinarians to track the course of disease more closely.

Overall, fibrinogen's diagnostic accuracy is 62%, compared to SAA's accuracy of 75%. Hence, Nolen-Walston has dubbed SAA "a souped-up fibrinogen." "It's not going to change your life, but it's going to make it arguably better," she told veterinary attendees. She then described how SAA concentrations can help identify particular equine health issues:

Gastrointestinal disease and colic While SAA measurements can't necessarily help veterinarians distinguish whether a colic is one that can be resolved medically or surgically, SAA can help them diagnose colitis, enteritis, and other inflammatory colics, said Nolen-Walston. "Surgical colics are less likely to have high SAA levels, so this finding should make a veterinarian think twice before exploring the abdomen" she said.

Respiratory disease Veterinarians should expect to see very high SAA concentrations if a horse has an infectious respiratory condition, such as bacterial pneumonia, and some elevation with viral lung disease. They should only see minimal SAA concentrations in horses with recurrent airway obstruction (heaves). "Probably the main use of SAA in horses with recurrent airway obstruction is distinguishing them from pneumonia cases, in which the SAA is likely to be much higher," Nolen-Walston said.

Surgery She also said SAA levels are worth looking at after surgery to identify postoperative complications. In animals with postoperative infections, veterinarians will notice a high SAA peak and a slow fall.

Joint disease While SAA concentrations are not apparent with typical osteoarthritis, they are a sensitive marker for septic (infected) joints, said Nolen-Walston.

Laminitis "The question of how SAA changes in laminitis is complicated by its myriad inflammatory as well as noninflammatory etiologies (causes)," she said. But, in a nutshell, SAA isn't going to tell you much. "If the SAA is increased in a foundered horse, look for a source of infection or inflammation."

Exercise Researchers have been examining how SAA concentrations respond to exercise in race and endurance horses. In these studies, said Nolen-Walston, SAA levels were unchanged post-racing but slightly elevated post-endurance ride. So while SAA might eventually help endurance trainers determine a horse's preparedness for advanced competition, there's still a lot of research to be done, she said.

Reproductive disease As can be expected, SAA levels rise with inflammatory reproductive diseases such as placentitis, and Nolen-Walston said they increased steadily until placentitis-related abortion occurred in study mares. "It is also normal for SAA to increase slightly in the few days after foaling (in normal mares), but very high levels probably indicate uterine inflammation or infection," she added.

Parasites Veterinarians do not detect SAA in heavily parasitized horses, or in these horses after deworming.

In summary, Nolen-Walston said SAA is a sensitive predictor of early inflammation and infection that outperforms fibrinogen. She cautioned, however, that SAA should not replace the veterinarian's physical exam and disease diagnosis.

"In a general sense, SAA can be used in most situations to obtain early identification of an inflammatory process, to assess the effectiveness of a chosen antimicrobial or other treatment, to monitor the rate of improvement, and to mark resolution of disease," she said.