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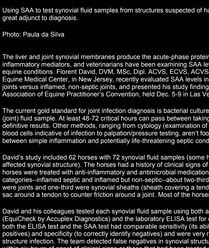
Can a Stall-Side Test Confirm Synovial Structure Infections?

Infected joint structures are serious business. They have the potential to end not only a horse's athletic career but also his life—these cases have a mortality rate of 10-50%. But confirming infection and its cause for pursuing proper treatment can be costly and time-consuming. Veterinarians have been exploring the accuracy of a speedier approach, looking at serum amyloid A (SAA) levels.



Using SAA to test synovial fluid samples from structures suspected of harboring an infection can be a great adjunct to diagnosis.

Photo: Paula da Silva

The liver and joint synovial membranes produce the acute-phase protein SAA in response to pro-inflammatory mediators, and veterinarians have been examining SAA levels for detecting a number of equine conditions. Florent David, DVM, MSc, Dipl. ACVS, ECVS, ACVSMR, ECVDI, of Mid-Atlantic Equine Medical Center, in New Jersey, recently evaluated SAA levels in inflamed, septic (infected) joints versus inflamed, non-septic joints, and presented his study findings at the 2015 American Association of Equine Practitioner's Convention, held Dec. 5-9 in Las Vegas.

The current gold standard for joint infection diagnosis is bacterial culture and sensitivity of a synovial (joint) fluid sample. At least 48-72 critical hours can pass between taking the sample and obtaining definitive results. Other methods, ranging from cytology (examination of cell types) to look for white blood cells indicative of infection to palpation/pressure testing, aren't foolproof in differentiating between simple inflammation and potentially life-threatening septic conditions.

David's study included 62 horses with 72 synovial fluid samples (some horses had more than one affected synovial structure). The horses had a history of clinical signs of inflammation, and some horses were treated with anti-inflammatory and antimicrobial medications prior to referral. In both categories--inflamed septic and inflamed but non-septic--about two-thirds of the affected structures were joints and one-third were synovial sheaths (sheath covering a tendon) and bursae (a fluid-filled sac around a tendon to counter friction around a joint. Most of the horses were lame at the walk.

David and his colleagues tested each synovial fluid sample using both a SAA stall-side test (EquiCheck by Acoupleix Diagnostics) and the laboratory ELISA test for comparison. They found that both the ELISA test and the SAA test had comparable sensitivity (its ability to correctly identify positives) and specificity (to correctly identify negatives) and were very reliable for detecting synovial structure infection. The team detected false negatives in synovial structures of six horses sampled within six hours of onset of clinical signs or those that had been treated within 48 hours with antimicrobials and/or anti-inflammatory medications. There were false positive results in five horses, but these don't have as serious consequences other than overtreatment and expense, whereas a false negative could be catastrophic.

The greatest difference David said they noted in sensitivity was between cases sampled within six hours and beyond six hours. "Testing of SAA in joints of horses tested at least six hours after the onset of clinical signs had an excellent correlation with infection," said David. SAA levels were higher in inflamed, septic synovial structures than in those that were inflamed but non-septic; horses in the nonseptic group tested negative for SAA or had low levels, he said.

David cautioned that these study results are only applicable when using the EquiCheck test. "If another bed-side SAA test is used the results of our study cannot be extrapolated," he said.

Take-Home Message
Using an SAA test to evaluate synovial fluid samples from structures suspected of harboring an infection can be a great adjunct to diagnosis. David said this rapid stall-side test can help the practitioner start aggressive treatment while awaiting definitive laboratory results from a bacterial culture and sensitivity, or it can serve to initiate immediate referral to a facility for treatment.