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Selecting the Best Joint Therapy Approach

A puffy fetlock. A knee that's warm to the touch. A hock that feels just a bit sticky in the trot. All are common performance problems pointing to the possible onset of osteoarthritis (OA). Equine joint therapy is often used to treat these types of OA-inflammation-related issues while potentially modulating disease.

Practitioners commonly use corticosteroid joint injections for this purpose, but sometimes they employ other medications to be used alone or in combination with corticosteroids. Peter Clegg, MA, VetMB, PhD, Dipl. ECVS, CertEO, MRCVS, of the University of Liverpool Veterinary Teaching Hospital, in Cheshire, U.K., reviewed the value of different non-steroidal joint medications.

Hyaluronan (HA)

Clegg reported that this commonly used intra-articular drug has reasonably good anti-inflammatory effects and can potentially improve cartilage matrix synthesis (the cartilage, which absorbs shock during weight bearing, continually produces more matrix; if arthritis or injury inhibits this ability, the underlying cartilage degrades). With joint inflammation, normal synovial fluid loses some of its lubricating ability. Adding exogenous (from outside the body) HA through a joint injection might rescue the lubricating properties within an injured joint, he noted. Clegg said he likes to use HA in a joint that is inflamed but has little to no radiographic changes indicative of OA. The best candidates are high-motion joints with capsulitis (joint capsule inflammation) or synovitis (inflammation of the synovial membrane lining the joint); inflammation in one or both of these structures is often a prelude to OA. Of veterinarians surveyed through AAEP, 62% reported using intra-articular HA to treat acute disease of high-motion joints. He said an affected horse's clinical lameness score often does not decrease with HA administration alone; usually veterinarians must combine HA with the corticosteroid triamcinolone to improve lameness. While no scientific data supports the idea that using higher molecular weight HA (which has greater viscosity) offers superior results, he noted that higher molecular weight proteins seem to better address synovial fluid viscosity.

Intramuscular drugs as IA options

Veterinarians commonly administer polysulfated glycosaminoglycans intramuscularly (IM), but they can also use these drugs effectively via the intra-articular (IA) route. There's no safety or efficacy data on using pentosan polysulphate, another IM drug, intra-articularly. "However," he said, "No detrimental effects have been seen in pentosan-treated joints compared to those injected with saline."

Regenerative medicine

Practitioners have found the use of stem cells in joints promising for producing cartilage matrix molecules, repair and growth factors, and trophic (nutritional) effects on cartilage. However, Clegg said, "There is no evidence of joint efficacy in the live horse although stem cells may be useful for soft tissue injuries within a joint." He said stem cells currently have no use in end-stage OA cases. Clegg also described using autologous conditioned serum (also known as the product IRAP for the interleukin-1 receptor antagonist protein it contains). "The best indications for its use," reported Clegg, "are with early OA with minimal inflammatory changes in the joint, or in joints with minimal response to corticosteroids." Clegg said another regenerative therapy, platelet-rich plasma, is best reserved for tendon and ligament injury. He does not recommend using bisphosphonates (Tildren) for OA therapy, either, as they might be toxic to cartilage cells. In summary, Clegg noted, "There is a lack of evidence for many of these nonsteroidal products to achieve profound clinical efficacy. Still, some medications may have a useful, ancillary role in the management of joint diseases."

Using Intra-Articular Corticosteroids

Corticosteroids can be an equine joint's best friend or its worst enemy, depending on the veterinarian's approach: Has he or she made a clear diagnosis of osteoarthritis? How many times has the horse's joint been injected already, and is the horse a high-performance athlete? Which joint is the vet targeting, and what's going on with the rest of the horse's body? Because there are many considerations for applying corticosteroid joint injections safely and effectively, Clegg addressed their use. "The use of corticosteroids in joints involves risk, especially where there is no definitive diagnosis," Clegg remarked. But with appropriate care and use, veterinarians might be able to mitigate these risks. He urged practitioners to first resolve a primary problem as thoroughly as possible before resorting to corticosteroid joint injections. That said, this stepwise approach can be a more expensive route. Clegg acknowledged the pressure veterinarians face from trainers and owners demanding joint treatment without a clear diagnosis. Clegg said there seems to be a "maintenance injection" culture in the United States unlike anything he has seen in Europe. "Corticosteroids have a profound effect on chondrocyte (cartilage cell) metabolism and are not at all advisable in the absence of joint inflammation," he warned. "If a horse requires repeat corticosteroid administration (to improve his soundness and athletic ability), then rethink other options to maintain athletic longevity," he said. "A recent paper relating to corticosteroid use in racehorses revealed some interesting data in which horses received from one to 74 IA corticosteroid injections over a lifetime—such frequent use of a powerful anti-inflammatory drug may not always be in the best welfare of the horse." Once the veterinarian defines a joint as truly needing treatment, the drug he or she selects depends on the joint involved. "Is it a high-motion or low-motion joint?" he asked. "Is the joint afflicted with capsulitis or synovitis? Or is the horse experiencing end-stage osteoarthritis?" Based on an AAEP member survey, responding practitioners who routinely treat joints preferred injecting the steroid triamcinolone (77%) in high-motion joints and methylprednisolone (73%) in low-motion joints. Corticosteroids pose a variety of risks to the patient. Infrequently, they can cause articular sepsis (bacterial infection of the joint), which might be difficult to diagnose early because the steroids themselves can mask clinical signs for up to 10 days. Many veterinarians worry about the risk of horses developing laminitis in the wake of this treatment, although scientists have made no definitive link between the devastating hoof disease and corticosteroid joint treatment. However, if a joint treatment candidate is obese, Clegg recommended using a low dose of corticosteroids or avoiding treatment altogether; an obese horse suffers from hormonal aberrations that increase his risk of developing laminitis under the best of circumstances. Another concern regarding corticosteroid use in joints is the potential for catastrophic breakdowns, such as what is seen in racehorses. He stressed that because corticosteroids can mask pain from an injury, racing a medicated horse with an undiagnosed subtle prodromal (early stage) fracture could cause a breakdown. In summary, Clegg recommended practitioners first establish a thorough diagnosis and only use corticosteroids in joints that will truly benefit from this therapy.

Preparing Joint Injection Sites

When administering joint injections, veterinarians must take steps to minimize the risk of septic arthritis developing in the treated joint. Particularly in equine athletes, septic arthritis can be a devastating and debilitating complication, though aggressive treatment returns a large range (27-92%) of affected horses back to work. Stephen Adams, DVM, MS, Dipl. ACVS, of Purdue University's School of Veterinary Medicine, described appropriate site preparation and needle selection for septic arthritis prevention. "Up to 80% of septic arthritis cases subsequent to joint injections are due to staph species that, in fact, live on the horse's skin, as well as the veterinarian's skin," Adams said. "One can never completely disinfect all layers of all portions of the skin." Still, preparing the injection site helps minimize the risk of joint contamination. In previous studies veterinarians have demonstrated that the presence of hair at the injection site does not inhibit antiseptics' ability to effectively reduce the skin surface bacterial flora to an acceptable level. In other recent studies investigators proved that scrubbing with chlorhexidine was superior to using tamed iodine (Betadine solution). Adams recommended that veterinarians perform a two-stage prep using sterile gauze sponges, chlorhexidine/saline, and isopropyl alcohol applied with gloves. He discouraged using prefabricated solutions, such as jars of gauze presoaked in Betadine or chlorhexidine solution, as they are susceptible to airborne contamination. ■ After placing a needle in the joint, allow the needle to clear with dripping joint fluid when possible. ■ Insert a needle at an angle to the joint surface rather than straight in.

■ Use 22-gauge spinal needles (rather than larger needles) to decrease the risk of introducing hair fragments.

■ Removing the stylet (the fine wire that runs through the needle) from a spinal needle increases contamination risk fivefold.

■ Deep layers of the skin cannot be disinfected.

■ There is no need to remove hair prior to joint injection unless using 20-gauge or larger spinal needles.

In conclusion, Adams stressed that veterinarians should take considerable care when preparing a site for joint injection, along with selecting optimal needle size and placement to minimize joint contamination and risk of developing infection

A New Tool for monitoring joint infection treatment in horses

Joint infections are a serious occurrence in horses with the potential to end an athletic career or even a life. Although survival rates are as high as 62% in foals and 85% in adults, only 48-66% of horses return to previous athletic activity after a joint infection. "A successful outcome requires early and aggressive treatment, including the intra-articular injection of a suitable antibiotic such as amikacin," said Andres Sanchez Teran, Vet MSc, of the University of Pretoria's Department of Companion Animal Clinical Studies, in South Africa (though he's currently at the Western College of Veterinary Medicine, University of Saskatchewan, Canada). Since there's no reliable way to determine if treatment is working, Sanchez Teran and his colleagues in Pretoria set out to find one. Scientists know that cells lining the inside of the joint produce a protein called serum amyloid A (SAA), and SAA levels increase in cases of infection. More importantly, SAA levels in synovial (joint) fluid do not increase following routine joint injections the way total protein and total nucleated cell counts (NCCs) do. "This means that SAA could be a better marker of joint infection (than total protein and other cell counts that are currently used)," explained Sanchez Teran.

To test this hypothesis, Sanchez Teran and colleagues collected synovial fluid by inserting a needle into the middle knee joints of five horses every two days for a total of five times. In the control group the team simply collected a fluid sample, and in the treatment group they injected the antibiotic amikacin after collecting the fluid. They measured SAA, total protein, and NCC in all samples and found:

■ As expected, total protein and NCC increased significantly after the first joint injection;

■ In some cases the protein and NCC levels were so elevated they reached the point that would be expected in infected joints; and

■ Synovial fluid SAA levels did not increase in either group of horses.

"Because SAA levels in synovial fluid are not affected by the process of inserting a needle or administering amikacin into a joint, SAA could potentially be used to monitor response to treatment following administration of amikacin into the joint," concluded Sanchez Teran.

He added, "For example, this means that if SAA levels are elevated in infected joints, the SAA levels would be expected to drop as the infection resolves."