AAEP 2008: Testing an Anti-Inflammatory Dietary Nutraceutical

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Horse owners commonly add nutraceuticals to their horses' diets to treat or prevent joint disease, but most products have no research data supporting their effectiveness. At the 2008 American Association of Equine Practitioners convention, held Dec. 6-10 in San Diego, Calif., Wendy Pearson, PhD, of the University of Guelph in Ontario, discussed the pathophysiology of joint inflammation and roles of specific chemical mediators in developing arthritis. She described a study in which she and colleagues evaluated the use of dietary nutraceuticals to modulate interleukin-1-induced inflammation. Interleukin-1 is one major regulator on the progression of osteoarthritis, as it sends signals related to joint inflammation that step up production of prostaglandin E_2 (PGE_2).

PGE_2 plays an important role in stimulating cartilage cells to divide and in maintaining cartilage health and stability. However, PGE_2 also increases production of enzymes that contribute to cartilage degeneration, just as it increases production of nitrous oxide, which promotes cell death and pain. IL-1 increases GAG (glycosaminoglycans) levels in the synovial fluid--these are the building blocks of cartilage. So, IL-1 and PGE_2 exert both positive and negative effects on joint cartilage. Within the inflammatory cycle of arthritis, there is a net decline in the structural integrity of cartilage and an increase in pain, inflammation, and cell death.

While non-steroidal anti-inflammatory medications block production of PGE_2 to effectively obsruct pain, cartilage breakdown continues. Corticosteroids prevent production of PGE_2 to block inflammation and pain, but they also inhibit synthesis of the cartilage matrix and increase risk of infection. So, the goal is to find another treatment that might address clinical signs of osteoarthritis while improving cartilage health.

Pearson described the evaluation of a dietary nutraceutical (Sasha's EQ by Interpath Pty Ltd, based in Australia) as a tool to alleviate symptoms of osteoarthritis. The 28-day study involved feeding this nutraceutical that is made up of concentrated marine extracts and a novel herbal extract. For 14 days pre-treatment, five of the 10 horses were fed a diet with the supplement while the other half were not. On Day 0, an intercarpal (inside the knee) joint on each horse was injected with a small amount of IL-1, while saline was injected into the same joint on the opposite leg. A second injection was given 24 hours later to induce inflammation. Veterinarians checked the synovial fluid in all joints 14 days prior to treatment and again on Day 0, Day 1, eight hours later, the next day, and again two days later. No horses developed lameness in this study.

The results showed significant inhibition of IL-1-induced PGE_2 production and release of GAGs in the limbs of horses that were treated with the dietary nutraceutical. The dietary nutraceutical potentially attenuated IL-1-induced PGE_2 to provide relief from arthritic pain and inflammation, and the inhibition of IL-1-induced GAG release provides evidence for protection of cartilage structure by the nutraceutical. Pearson noted some literature supports evidence of an increasing amount of GAGs in synovial fluid through dietary provision. More research is needed to evaluate these findings and further investigate nutraceutical effects on nitrous oxide production on the living horse.

Readers are cautioned to seek the advice of a qualified veterinarian before proceeding with any diagnosis, treatment, or therapy.