Autologous Conditioned Serum Composition Evaluated

Joint disease: It's progressive, incurable, and widely prevalent among performance horses. Veterinarians can, however, provide affected horses with some relief in the form of conventional therapies, such as corticosteroids and/or hyaluronic acid injections or, in severe cases, biologic treatments. But first, a little background on how ACS works. When a joint sustains injury, trauma stimulates the release of inflammatory proteins within the joint including IL-1 (interleukin-1). This cytokine itself is pro-inflammatory and promotes joint destruction. IL-1 stimulates the release of other cytokines, such as IL-6 and IL-8, which further feed the cycle of inflammation and cartilage degradation that leads to an overall downward spiral of joint degeneration.

The objective in using ACS is to block the activity of interleukin-1 receptor antagonist protein. IL-1 receptor antagonist protein (IL-1ra) prevents IL-1 from binding to its receptor, thereby blocking the pro-inflammatory activity of IL-1. IL-1ra is a naturally occurring protein that is produced by healthy tissue to control inflammation. ACS is created by drawing blood from the horse and incubating it for 24 hours in a syringe with borosilicate beads that stimulate IRAP production. Centrifuging the serum permits separation of the serum from the blood cells for immediate injection back into the horse. The procedure is non-invasive, requires no needles, and is repeatable. It is meant to block pro-inflammatory cytokines, allowing the joint to heal itself.

In the study Tatarniuk described, he and colleagues selected 11 horses with confirmed coffin joint arthritis and administered ACS as three injections spaced seven days apart: Day 0, 7, and 14. He said ACS was chosen for this treatment; or
Secondly, "when looking at all biomarkers (other proteins than IL-1ra) there still is a difference in the number of needle sticks in the joint or the presence of blood contamination had no effect on the concentration within synovial fluid found when synovial fluid was sampled seven days following treatment; or

The IL-1ra protein is degraded, absorbed, or metabolized out of the joint within the seven day timeframe. The IL-1ra protein is highly actively bound to the IL-1 receptor. Therefore there was no increase in IL-1ra concentrations in ACS compared to control serum groups, ACS was different from regular serum but not different compared to the incubated control group. When evaluating IL-6 and IL-8 concentrations, however, IL-1ra was unchanged in synovial fluid samples as compared to the baseline prior to treatment, Tatarniuk said. Following ACS administration, IL-1ra concentrations in ACS compared to control serum groups, ACS was different. When looking at all biomarkers (other proteins than IL-1ra) alone. This statement only holds true when looking at IL-1ra, however many proteins

In the context of the current study, Tatarniuk noted that ACS may have a role in treating joint disease in horses. It has been used in these cases to manage inflammation and promote healing. In the study, ACS was administered to 11 horses with confirmed coffin joint arthritis. The horses were divided into two groups: one received ACS injections every seven days for three doses, and the other received a placebo injection. The horses were monitored for 21 days following the injections.

The IL-1ra protein is highly active bound to the IL-1 receptor. Therefore, there was no increase in IL-1ra concentrations in ACS compared to control serum groups. ACS was different from regular serum but not different compared to the incubated control group. When evaluating IL-6 and IL-8 concentrations, however, IL-1ra was unchanged in synovial fluid samples as compared to the baseline prior to treatment, Tatarniuk said.

Interestingly, he said, there were no changes in lameness scores throughout the 21 days. More research is needed to confirm the actual cause of this finding, he added. "This is an important consideration, as if the therapy is only staying in the joint for a very transient period, its usefulness can be questioned," Tatarniuk said. He isn't sure why there was no change, but his team has several hypotheses, including:

1. The therapy is not staying in the joint long enough to be effective.
2. The therapy is not being absorbed into the joint tissue.
3. The therapy is not being effectively delivered to the sites of inflammation.

He said he isn't sure why there was no change, but his team has several hypotheses, including:

1. The therapy is not staying in the joint long enough to be effective.
2. The therapy is not being absorbed into the joint tissue.
3. The therapy is not being effectively delivered to the sites of inflammation.

The number of needle sticks in the joint or the presence of blood contamination had no effect on the concentration within synovial fluid found when synovial fluid was sampled seven days following treatment; or

In the study Tatarniuk described, he and colleagues selected 11 horses with confirmed coffin joint arthritis and administered ACS as three injections spaced seven days apart: Day 0, 7, and 14. He said ACS was chosen for this treatment because it is a non-invasive procedure that requires no needles and is repeatable. It is meant to block pro-inflammatory cytokines, allowing the joint to heal itself.